

21.382 Novelty

*Electricity*  
ILLUSTRATED

*Living*  
GRANVILLE  
INSTITUTE  
OF ARTS

Catalogue and Price List

OF

EVERYTHING

ELECTRICAL

NOVELTY ELECTRIC CO.,

Manufacturers, Importers, Dealers,

AND

Manufacturers' Agents,

S. W. Cor. Fifth & Locust Streets,

PHILADELPHIA.

CRAIG, FINLEY & Co., Printers, 1020 Arch St., Phila.

1885.



## SHIPMENTS.

Orders should be accompanied by a clear address, and by full instructions as to route of shipment when there is any preference. State whether goods are to be sent by freight or express.

*Articles* weighing less than four pounds can be sent by mail to any *point in the United States*. *Canada* permits but eight ounces. Batteries can not be sent by mail.

Goods will be sent C. O. D. by express, provided a remittance of not less than one-third of price be sent with order.

All goods at risk of purchaser after shipment.

We cannot allow goods to be returned to us without first securing our authority to do so.

Any error on our part should be promptly reported to us.

## IMPORTATION FREE.

Colleges, schools, literary, scientific or religious societies of the United States can save 25 per cent. on scientific books, and 40 per cent. on instruments and apparatus they may want to import from foreign countries, by ordering through us.

## TERMS.

Liberal discounts to the trade, and special prices on large orders.

Our terms are cash, unless otherwise arranged.

Remittances may be made by bank draft, post-office order, postal note, postage stamps, or registered letter.

C. O. D. orders must be accompanied by a remittance of not less than one-third of the price of articles ordered.

## NOVELTY ELECTRIC COMPANY,


Fifth and Locust Streets,

Philadelphia, Pa.

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NOTE.—Prices here given are current prices of the day, and are subject to change without notice.





# The Batteries to Use.

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OPEN CIRCUIT BATTERIES, such as the NOVELTY DISQUE, LECLANCHE, PRISM or DISQUE, or similar batteries, are best adapted for use in connection with ordinary BURGLAR ALARMS, CALL BELLS, ANNUNCIATORS, GAS LIGHTING, etc.

These batteries are clean, give out no fumes, and do not waste when not in use. The NOVELTY DISQUE BATTERY will perform the ordinary service of ringing HOUSE BELLS, BURGLAR ALARMS, etc., for one or more years without requiring renewal.

CLOSED CIRCUIT BATTERIES, such as the CALLAUD, GRAVITY, EAGLES, etc., are best adapted for Telegraph and Telephone uses, where the use is constant, or nearly so. These batteries are exhausted more rapidly in occasional use than the open circuit batteries, and require more attention; they are, however, very cheaply maintained.

The NOVELTY CARBON BATTERY, A. or C., is best adapted for experimental uses where a powerful current is required for a short time. It is so arranged that the zinc can be removed from the fluid when not in use, thus avoiding waste.

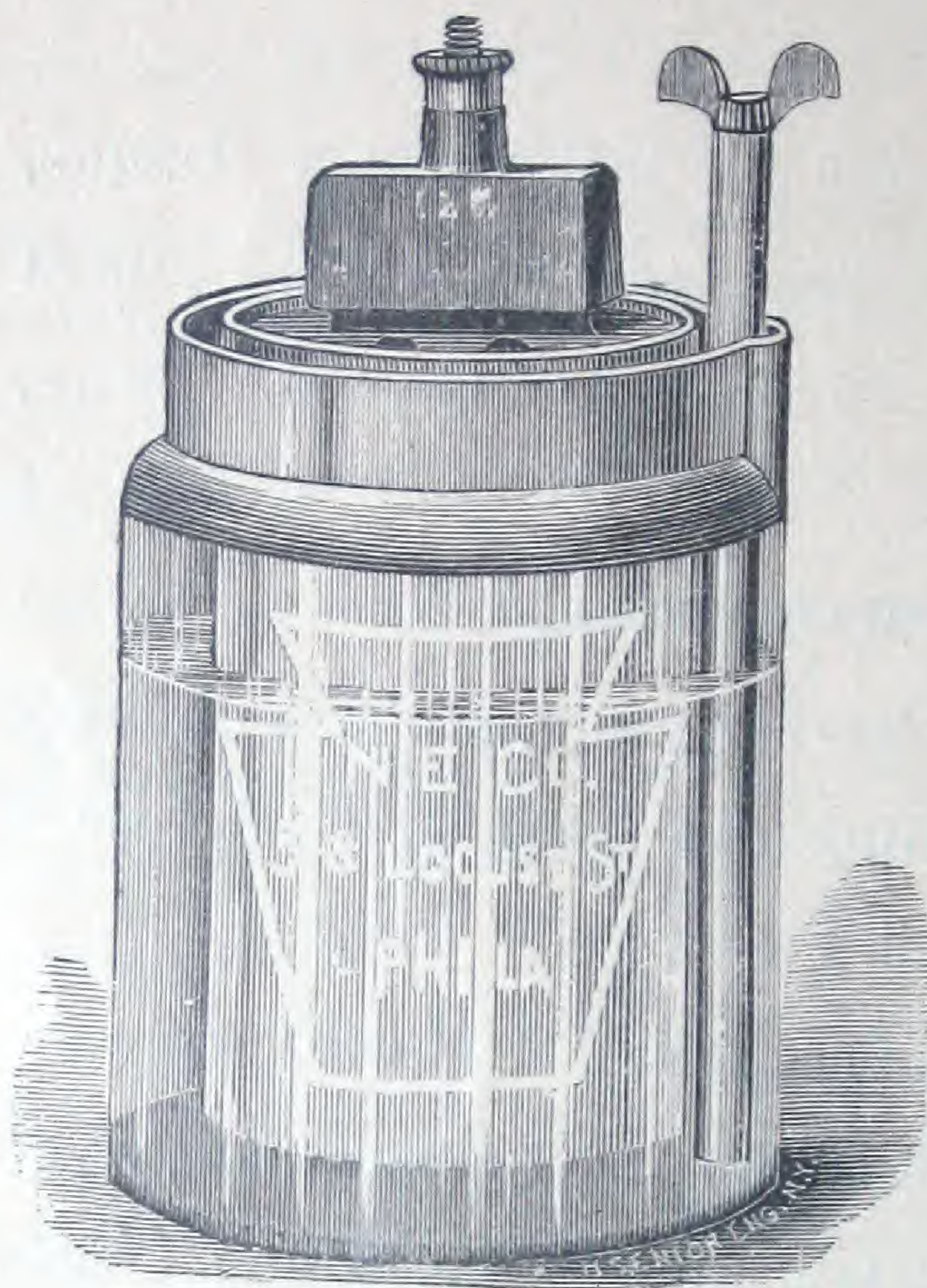
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NOTE.—Labels on the jars clearly direct how all kinds of Novelty Batteries are to be set up and cared for.



# NOVELTY DISQUE BATTERY.

THE BEST FOR OPEN CIRCUIT WORK.



We take pleasure in offering to all parties engaged in electrical work our NOVELTY DISQUE BATTERY, which we import direct to meet the demands of our customers for a thoroughly reliable open circuit battery. The excessive competition in this line of goods has led to the manufacture and sale of many varieties of so-called Disque batteries, that resemble the genuine article in appearance only, and are utterly unworthy of use.

## PRICES.

Battery, complete,	\$1.00
Porous Cup,	.75
Glass Jar,	.18
Zinc, with Connector,	.10
Sal ammoniac,	.08

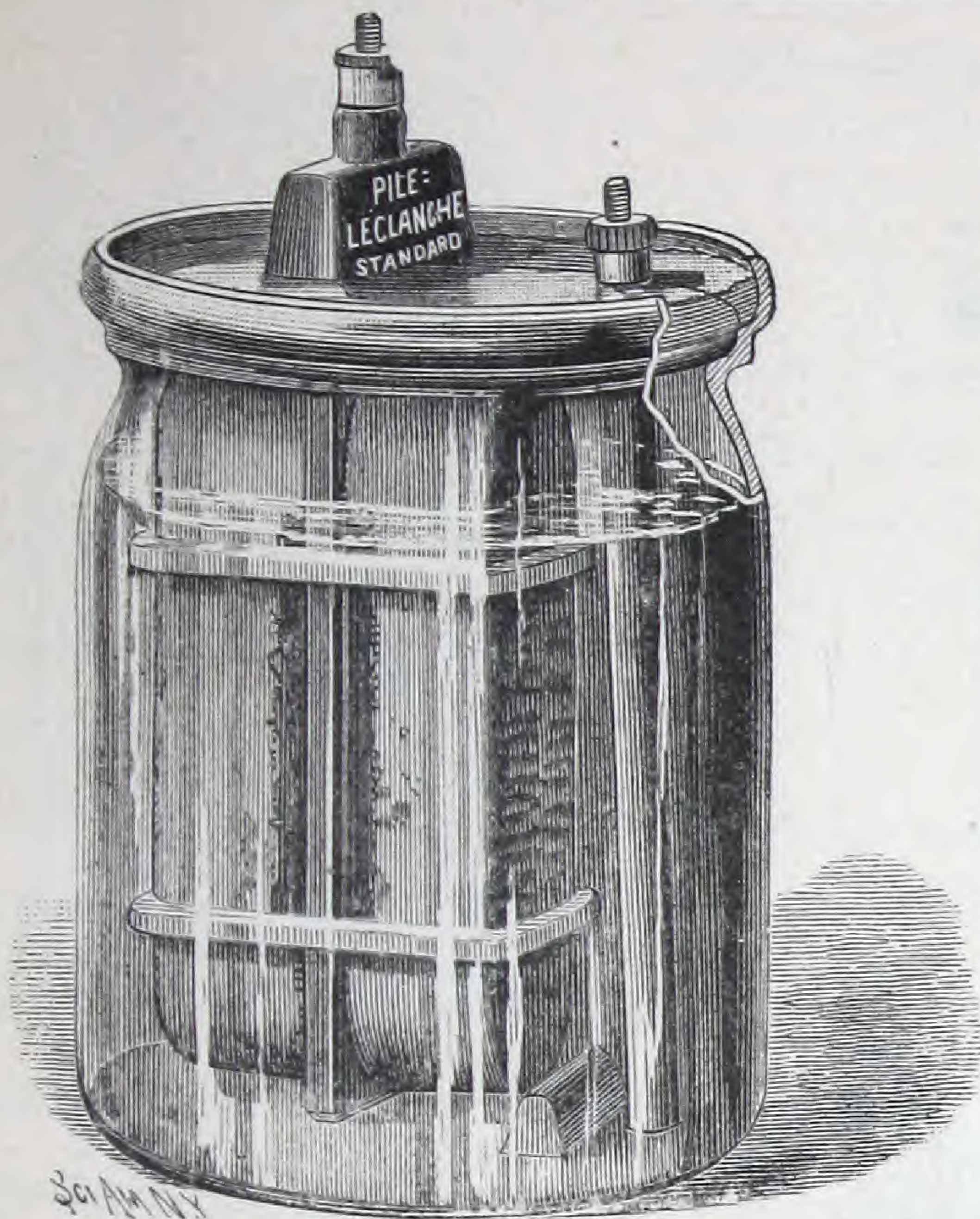
Special prices for large quantities given upon application.



# LECLANCHE PRISM BATTERY.

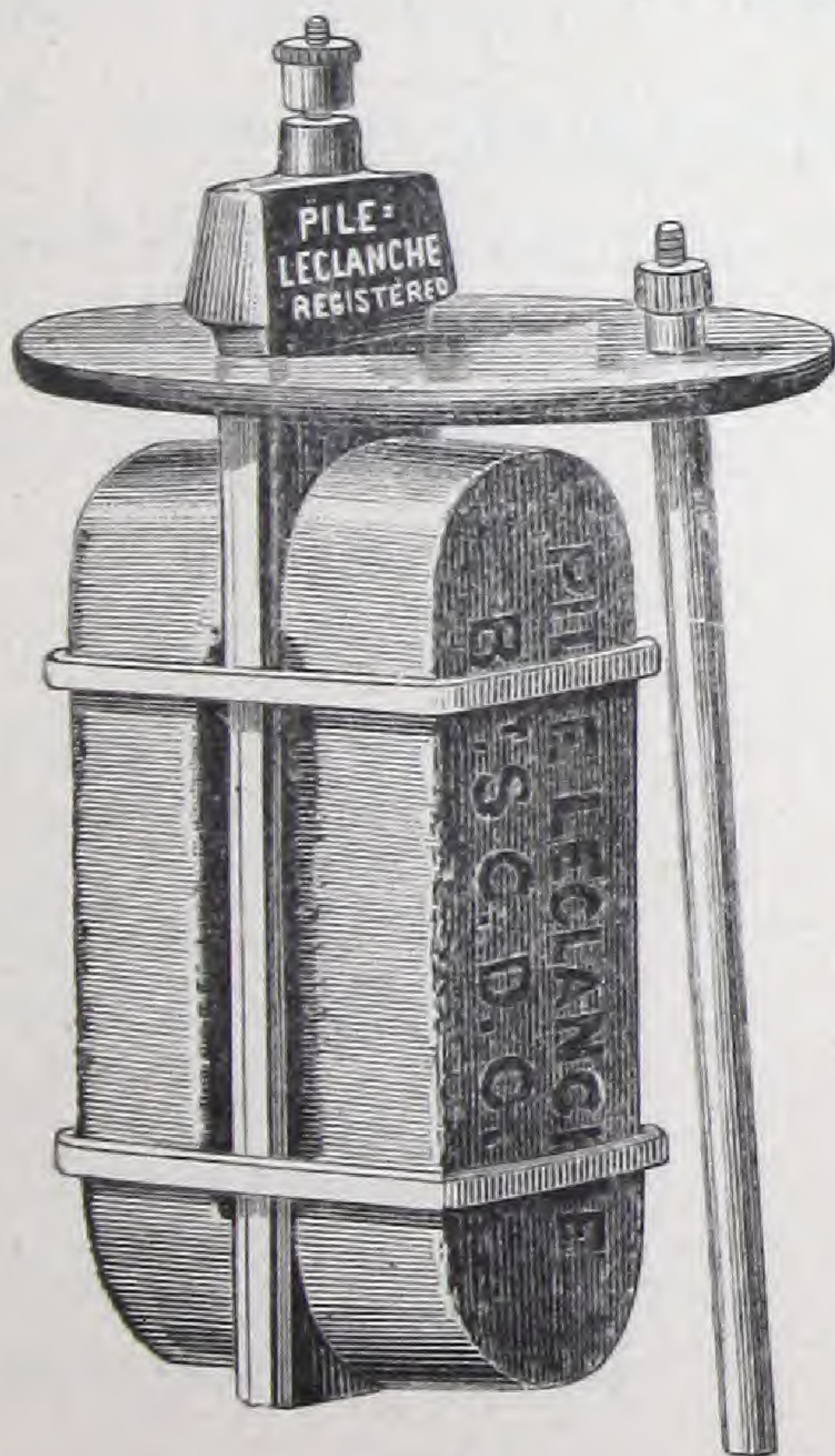
FOR OPEN CIRCUIT WORK.

THE LATEST AND MOST IMPROVED FORM.



In this battery the porous cup is dispensed with, and in its place is substituted a pair of compressed "prisms," which are attached to the carbons by two rubber bands. The prisms contain all the material heretofore employed in the porous cup, combined with others not before used, compressed into this compact and convenient form by powerful hydraulic machinery.

## TO RENEW THE PRISM BATTERY.



When the elements have become exhausted from long service, take off the prisms, soak the carbons (below the head) in hot water, attach new prisms, and set up as before with zinc and sal ammoniac.

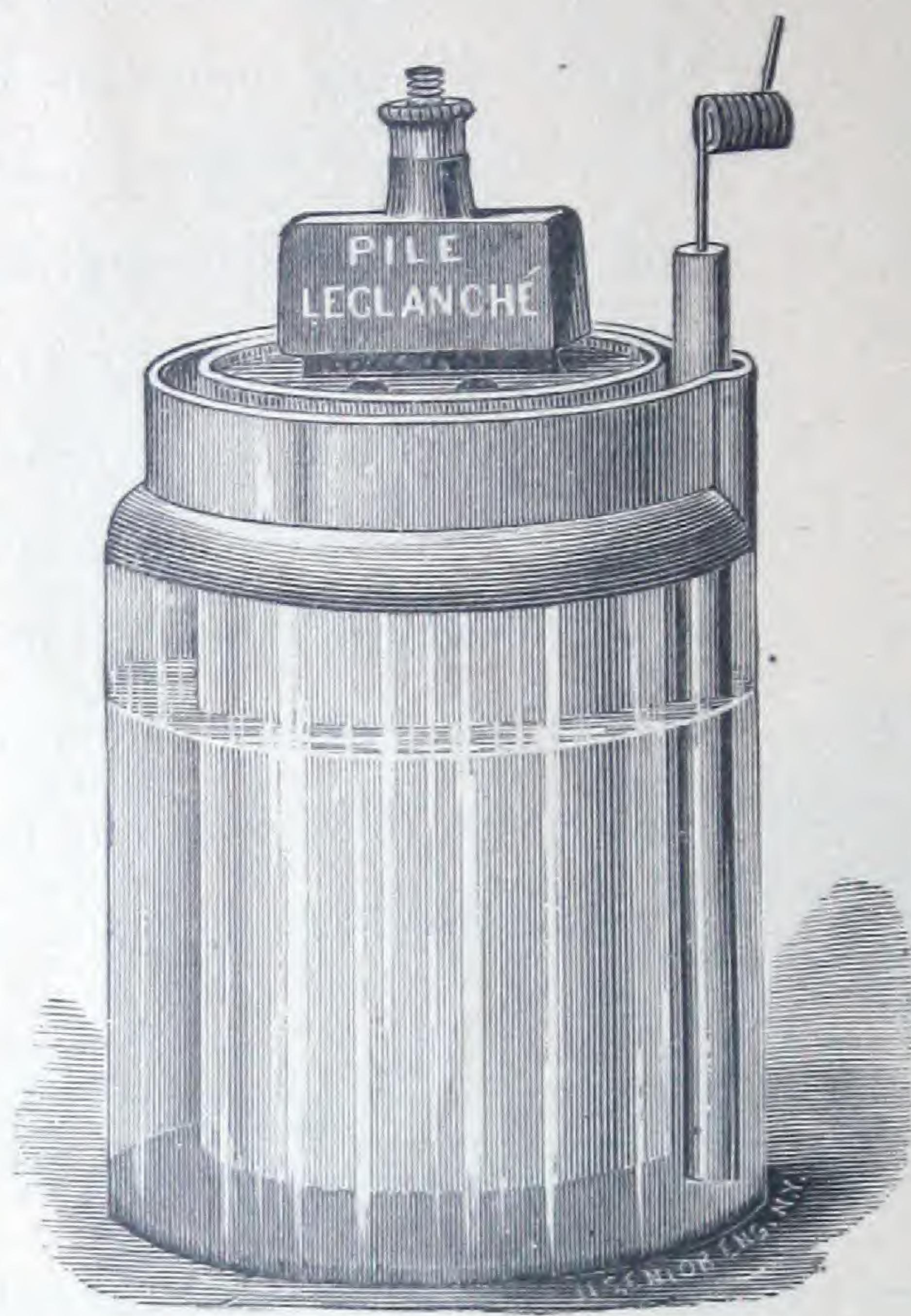
## PRICES.

Battery, complete,	\$1.50
" Prisms, per pair,	.90
" Carbon, mounted,	.30
" Jar,	.20
" " Top,	.12
" Zinc,	.10
Sal ammoniac, per bag,	.08
Complete Cell, sealed,	1.65



# DISQUE LECLANCHE BATTERY.

FOR OPEN CIRCUIT WORK.



Adopted by Telephone Companies as a desirable battery for operating Telephone Transmitters. Will give good satisfaction in operating House and Hotel Annunciators, Burglar Alarms, Call Bells, Electric Gas Lighting, etc.

In the cell of the LECLANCHE DISQUE, the negative element consists of a porous vessel filled with carbon and pounded peroxide of manganese, the exciting liquid used is chloride of ammonium. The great merit of this cell is that it is very permanent. It

will keep in good condition for months with little or no attention, furnishing a current when wanted.

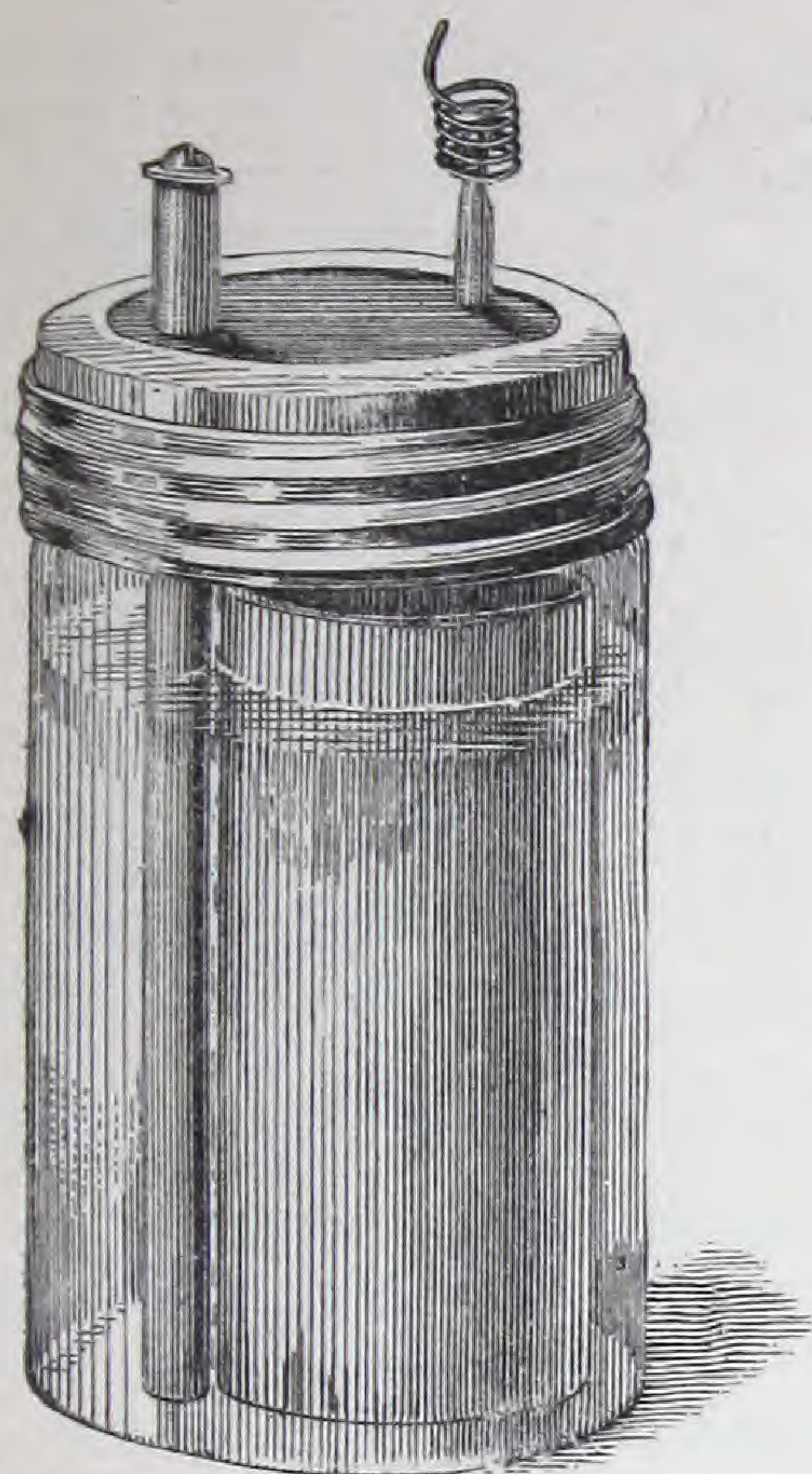
## PRICES.

Battery, complete,	\$1.00
Porous Cup,	.75
Glass Jar,	.18
Zinc, with Connector,	.10
Sal ammoniac,	.08



## BERGMAN BATTERY.

FOR OPEN CIRCUIT WORK.



This is a cheap form of open circuit cell, put up in small and portable shape. It is hermetically sealed, and can be safely transported with its contents intact.

### DIRECTIONS.

The battery is furnished with sal ammoniac. Unscrew the top and fill the glass jar with water to within one inch of the top of the porous cup, and the battery is ready for use.

### PRICES.

Per Cell, complete, with sal ammoniac,	\$1.20
Porous Cells, each,	.75
Zincs, each,	.10
Jars, each, with tops,	.45

## NEW "LAW PRISM" BATTERY.

FOR OPEN CIRCUIT WORK.

CORRUGATED PRISMS, LOCK TOPS.

A very superior open circuit battery for Electric Gas Lighting, Burglar Alarm, and Call Bell work.

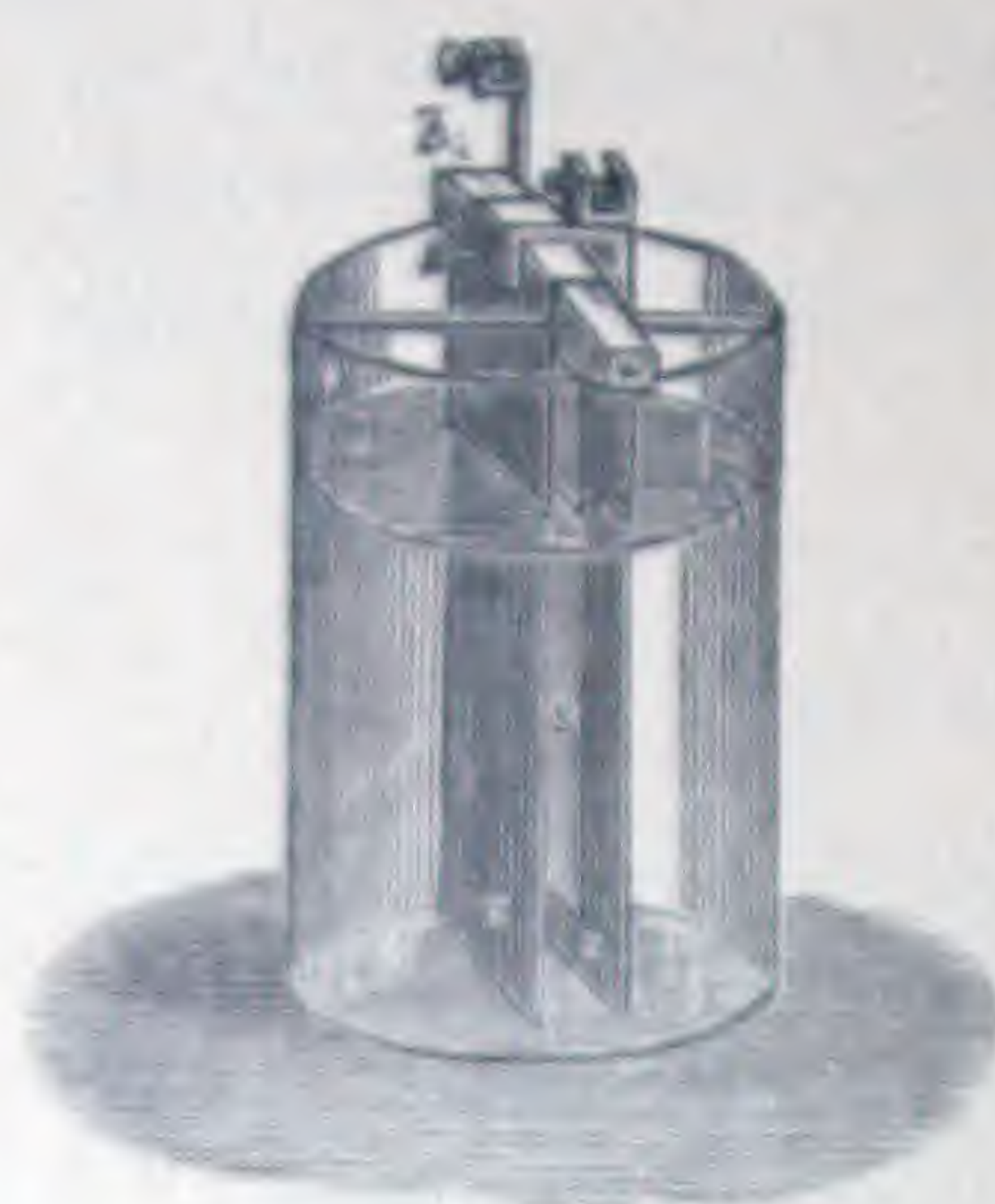
### PRICES.

Per Cell, complete,	\$1.50
Zincs, with rings,	.08
Zinc Connectors,	.08
Covers, with sealed carbons,	.35
Carbon Connectors,	.12
Rubber Bolts,	.12
Jars, with rings,	.30
Prisms, per pair,	.50
Sal ammoniac, per bag,	.08



# SMEE BATTERY.

## FOR OPEN CIRCUIT WORK.



This form of battery has, perhaps, been more extensively used than any other galvanic arrangement. It consists, in its best form, of a plate of platinized silver for the negative element, with two plates of zinc for the positive element.

The zinc plates are usually placed on either side of the silver. The solution consists of one part sulphuric acid to seven parts of water.

This battery is admirably adapted for electro-plating purposes, and for general galvanic experiments. It is easily managed, is tolerably constant, and requires only one exciting fluid, therefore porous cells are dispensed with.

### PRICES, with Platinized Silver Plates.

	No. 1.	No. 2.	No. 3.	Kidder Pattern.
Size of Zinc Plates.....	3½x4½	3½x7½	4x8	2½x2½
Cell, complete.....	\$3.00	\$3.75	\$5.25	\$2.50
Glass Jar.....	.30	.30	.37	.45
Platinized Silver Plate.....	1.50	2.00	3.00	1.50
Connector.....	.18	.18	.18	.....
Zincs (Rolled) pair.....	.50	.60	.95	.40
Zinc Clamp.....	.60	.60	.60	.40
Wood Support.....	.08	.08	.10	.....

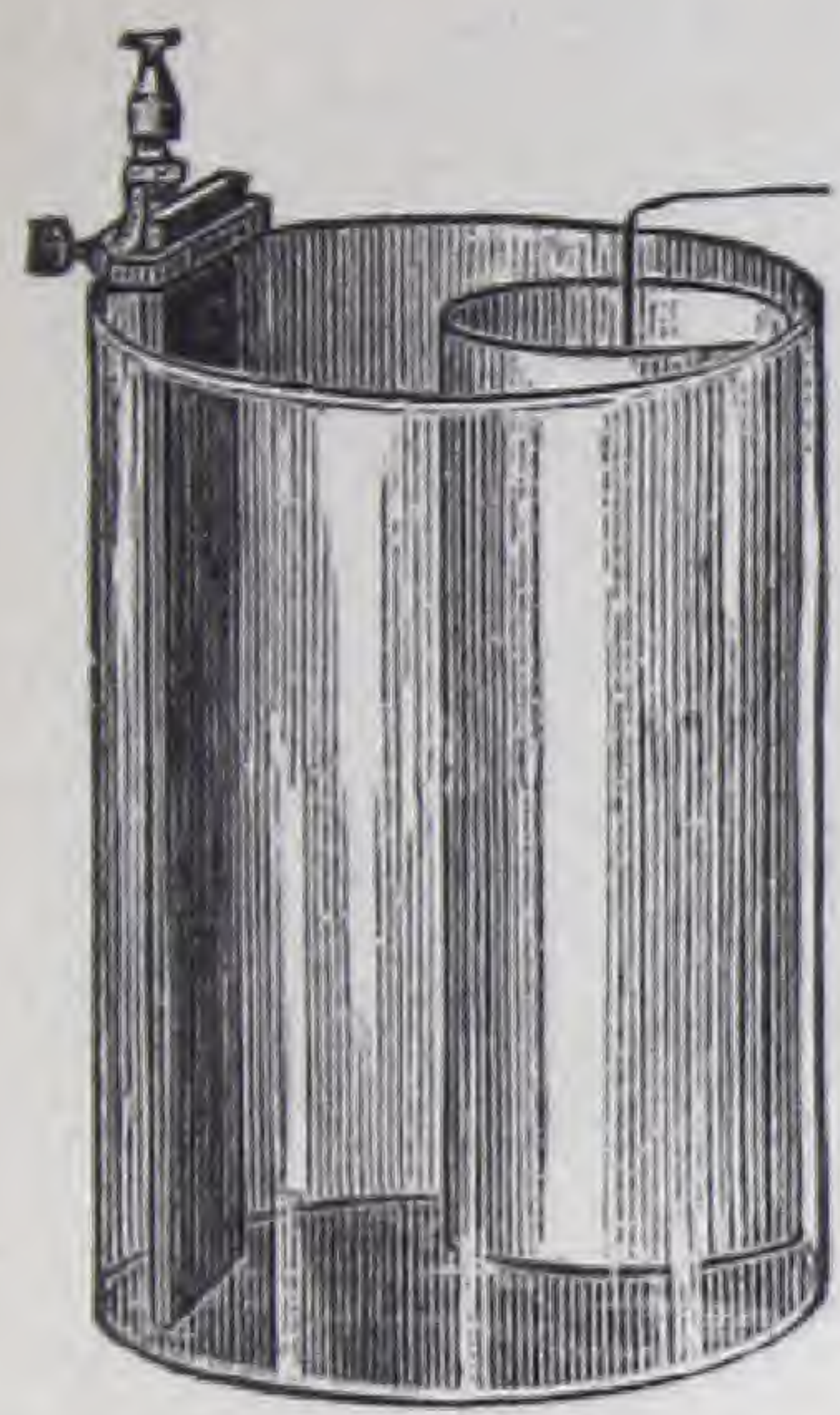
### With Carbon Plates.

	No. 1.	No. 2.	No. 3.	No. 4.
Size of Zinc Plates.....	3½x4½	3½x7½	4x8	6x10
Cell, complete.....	\$2.50	\$2.75	\$3.50	\$5.00
Glass Jar.....	.30	.30	.37	.75
Zincs (Rolled) pair.....	.50	.60	.95	1.60
Carbon and Connections.....	.75	.90	1.20	1.75
Carbon Connector.....	.18	.18	.18	.18
Carbon Insulator.....	.09	.09	.10	.10
Clamp.....	.60	.60	.60	.60
Wood Support.....	.08	.08	.10	.10



# FULLER MERCURY BICHROMATE BATTERY.

## FOR OPEN CIRCUIT WORK.



This form of Carbon battery is a most excellent one for any or all of the uses to which strong Carbon batteries are adapted.

Having all the powerful qualities of any of the various forms of Carbon-Electropoion batteries, its two great advantages consist in its being self-amalgamating from the supply of mercury in the porous cell, and in the great amount of sulphuric acid and bichromate (Electropoion) capable of being held in the outside jar, thus giving much longer action than can be sustained in other acid batteries.

At the same time its quantitative effects may be very greatly increased by doubling or trebling the carbon surface, in other words, using two or three carbons instead of one.

As this battery is capable of remaining on open circuit for weeks at a time without much deterioration and without any attention, it is well adapted for ringing very large electric bells or for any use where a specially powerful open circuit battery is required, or where the *Novelty Disque Battery* is not strong enough without applying too many cells. This form is also well adapted for a laboratory test battery, and for all general experimenting.

### PRICES.

PARTS.	LARGE SIZE. SMALL SIZE.	
	Jar 6x8 in.	Jar 5x6 in.
Per Cell, complete.....	\$1.00	\$ .75
Zincs, each.....	.20	.15
Carbons, with Connector attached, each.....	.45	.25
Jars, each.....	.30	.25
Porous Cups, each.....	.15	.15
Zinc Connectors, (extra).....	.15	.15

# ORNE BATTERY.

## FOR OPEN CIRCUIT WORK.

The elements of this battery are zinc and carbon. The nature of the exciting fluids is precisely similar to that of the Fuller Mercury battery, described above, with the additional advantage of having a closely fitting top which permits of its being safely transported with all its contents intact. It will last for many months without refilling.

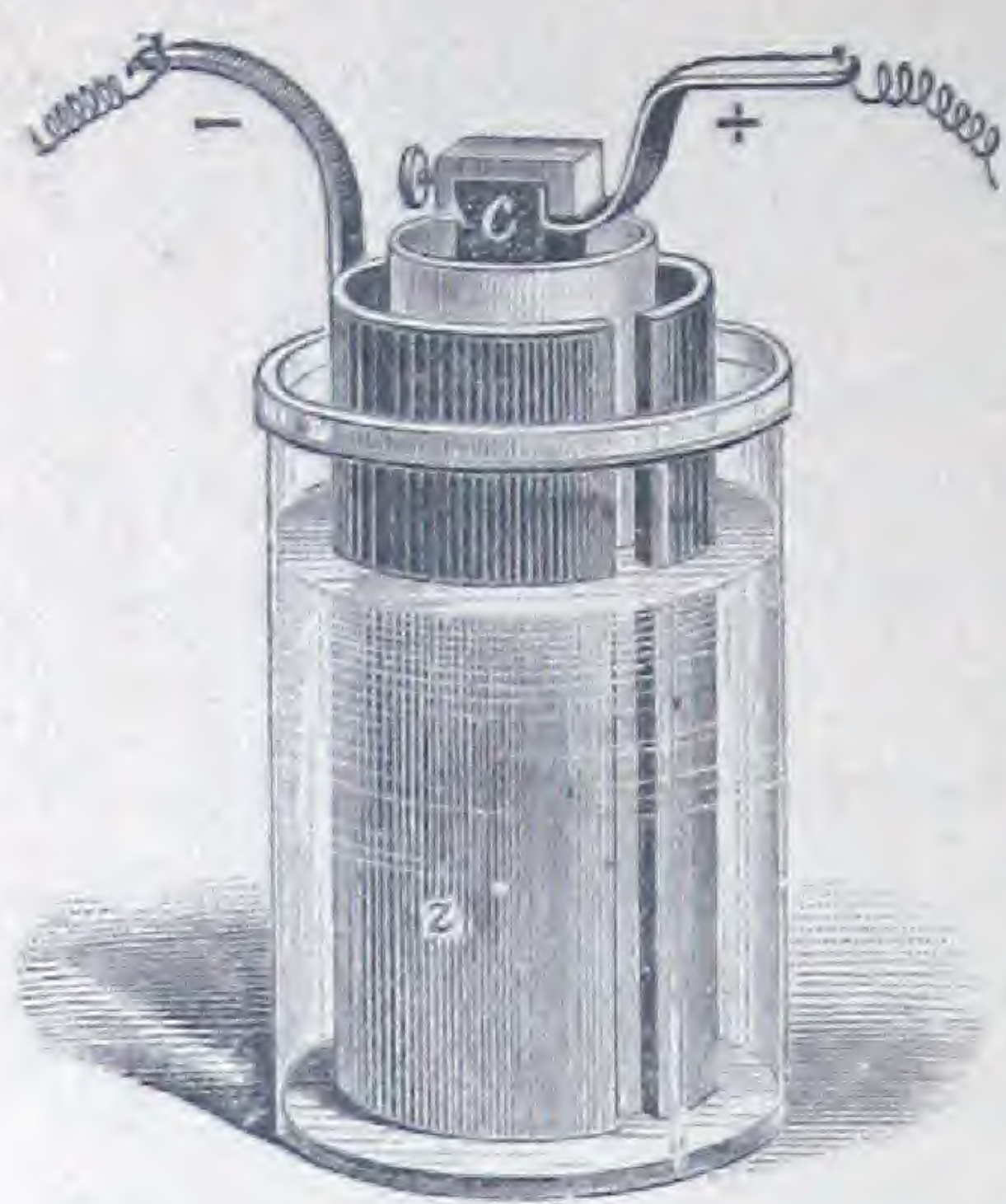
### PRICE.

Per Cell, complete.	\$1.40
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## BUNSEN BATTERY.

FOR OPEN CIRCUIT WORK.



The elements of this battery are zinc for the positive and carbon for the negative element. A porous cell and containing jar and two exciting fluids are required. The general arrangement of the Bunsen battery and the nature of the two exciting fluids are precisely similar to those of Grove's battery. The carbon usually employed for Bunsen's battery is obtained from the deposited carbon found in the retorts at gas works.

### PRICES.

Size.....	$\frac{1}{2}$ pt.	1 pt.	1 qt.	2 qts.	1 gal.	2 gals.
Cell, complete.....	\$ .90	\$1.20	\$1.50	\$2.00	\$3.00	\$5.75
Carbon.....	.10	.12	.12	.35	.50	1.40
Carbon Connection.....	.25	.40	.40	.45	.80	1.10
Glass Jar.....	.13	.20	.25	.30	.35	.75
Porous Cup.....	.12	.13	.15	.20	.25	.75
Zinc and Connection.....	.30	.40	.60	.70	1.10	1.75

## GROVE BATTERY.

FOR OPEN CIRCUIT WORK.

One of the most extensively used of all the two fluid cells. This differs from Daniell's element in having nitric acid with a platinum electrode in the porous cell, instead of the copper solution and the copper electrode of Daniell's element.

The electromotive force of Grove's cell is higher than that of Daniell's, and its internal resistance is very much less. On this account the cell is much used for working induction coils, etc.

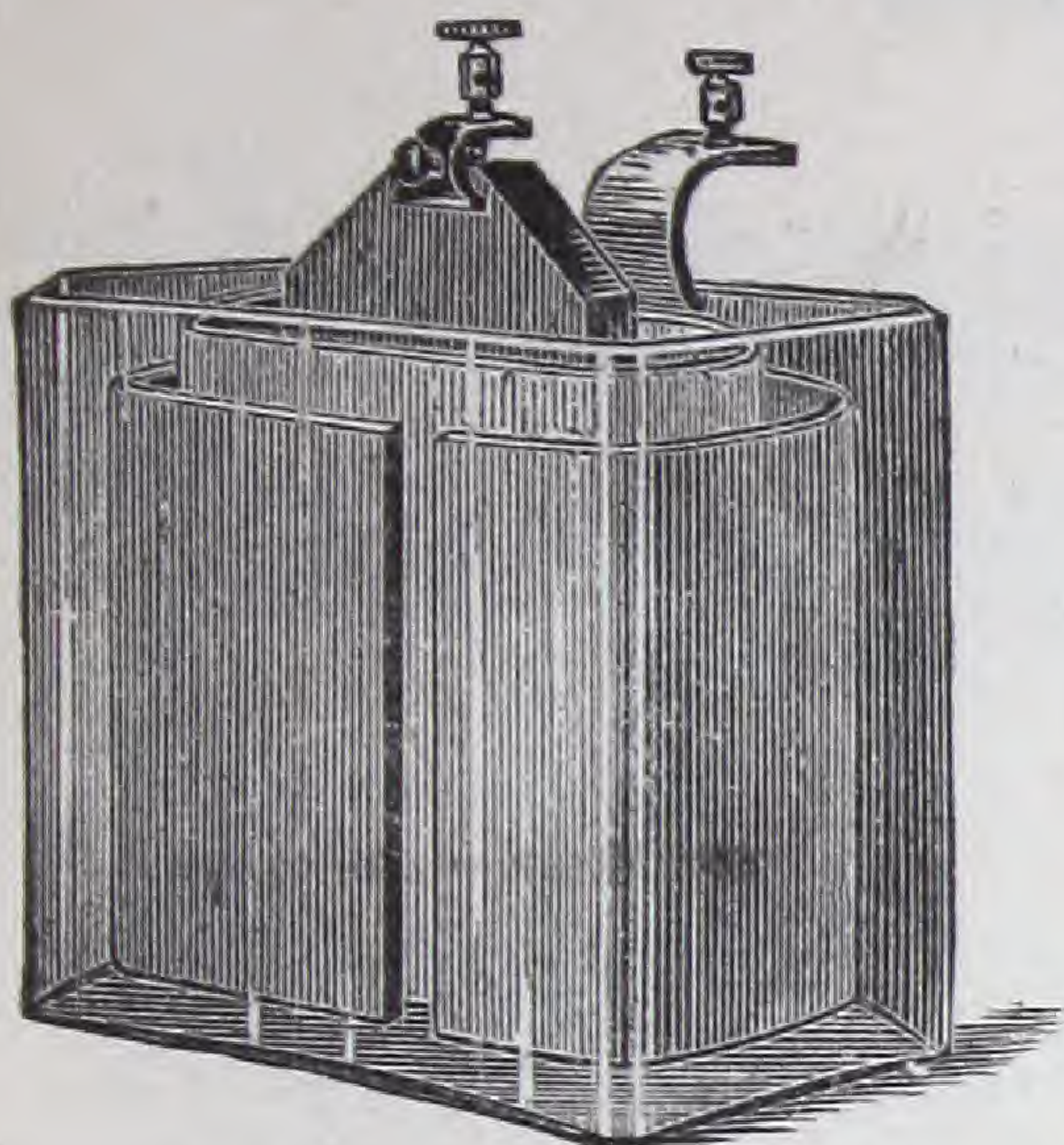
### PRICES.

Per Cell.....	\$1.60	Tumblers, each.....	\$ .25
Platinum.....	.80	Zincs.....	.45
Porous Cups.....	.15	Platinum, Standard.....	.50



## NICKEL-PLATING BATTERY.

FOR OPEN CIRCUIT WORK.



An improved Bunsen cell of great power, for Nickel and Electro-plating, Striking, Electro-motors, etc. One hundred gallons of nickel-solution have been used successfully with two of these cells. The glass jars contain six quarts, forming a very convenient tank for experimental work.

### DIRECTIONS.

In setting up the Nickel-Plating Battery, amalgamate the zincs thoroughly, inside and out. Into the porous cup put two ounces of nitric acid, and half fill the cup with a mixture of equal parts, by measure, of water and sulphuric acid. Place the carbon in the porous cup, and add the above mixture until it reaches the proper height, as mentioned below. Put the zinc in the outer or glass jar, and fill to top of zinc with a mixture of one part of sulphuric acid to twelve parts of water, previously mixed and allowed to cool. The fluids in the porous cup and outer jar should be of the same height. When the liquid in the jar becomes milky, replace it with fresh solution. Add occasionally a little nitric acid to the liquid in the porous cells, and keep the zincs well amalgamated. Nitric acid at forty degrees, clear or saturated with bichromate of potash, increases the intensity of this battery; or, if desired, the Carbon Battery fluid may be used.

### PRICES.

PARTS.		PARTS.	
Per Cell, complete.....	\$5.00	Jars, each.....	\$1.00
Carbons, each, 1x4x9 in.....	1.60	Zinc, Heavy Rolled, each.....	1.00
Carbon Clamp, Platinum Faced.	1.00	“ Connectors, each.....	.15
Porous Cups, each.....	.50		

## CARBON BATTERY.

FOR OPEN CIRCUIT WORK.

This is a powerful form of acid battery, yielding an electric current of considerable intensity. It is principally used for electrolysis, chemical analyses, operating large induction coils, and other scientific purposes requiring a very powerful current for a short time.

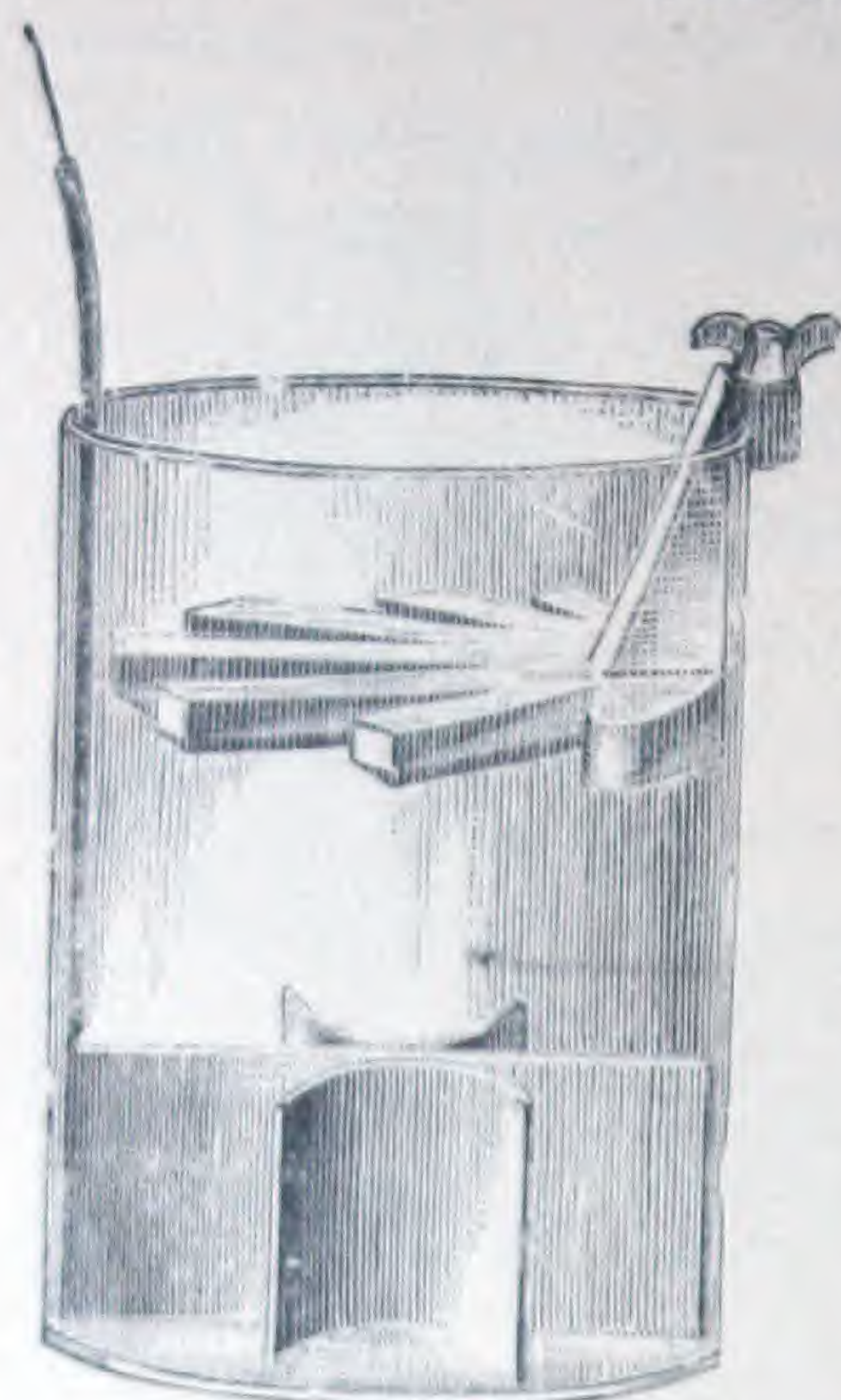
### PRICES.

PARTS.	No. 1.	No. 1½.	No. 2.
Cell, complete.....	\$1.35	\$1.70	\$4.25
Carbon.....	.12	.35	.50
Carbon Connection.....	.22	.22	.50
Carbon Clamp.....	.10	.15	.25
Glass Jar.....	.25	.25	.35
Porous Cup.....	.12	.12	.25
Zinc.....	.40	.50	2.25
Zinc Connector.....	.15	.15	.20



# CROW FOOT BATTERY.

FOR CLOSED CIRCUIT WORK.



This is a thoroughly efficient form of *Blue Vitriol Battery*, for use in *Telegraph "Mains"* and "*Locals*" on either short or long lines. It is very simple, consisting practically of but three parts. It is the easiest of all *Gravity Batteries* to set up or clean, and its *cheapness*, compared with old forms, makes it the *most satisfactory battery* in the market. It has been adopted by all the leading *Telegraph Companies*, where its efficiency has been thoroughly demonstrated on a large scale. A considerable part of the cost of all the old forms of *Gravity*

*Batteries* is made up by complicated and useless attachments, and by fancy shapes given to the zincs.

The main item of cost in the *Crow Foot Battery* is made up in the *weight of the zinc*, on which the battery depends for its efficiency.

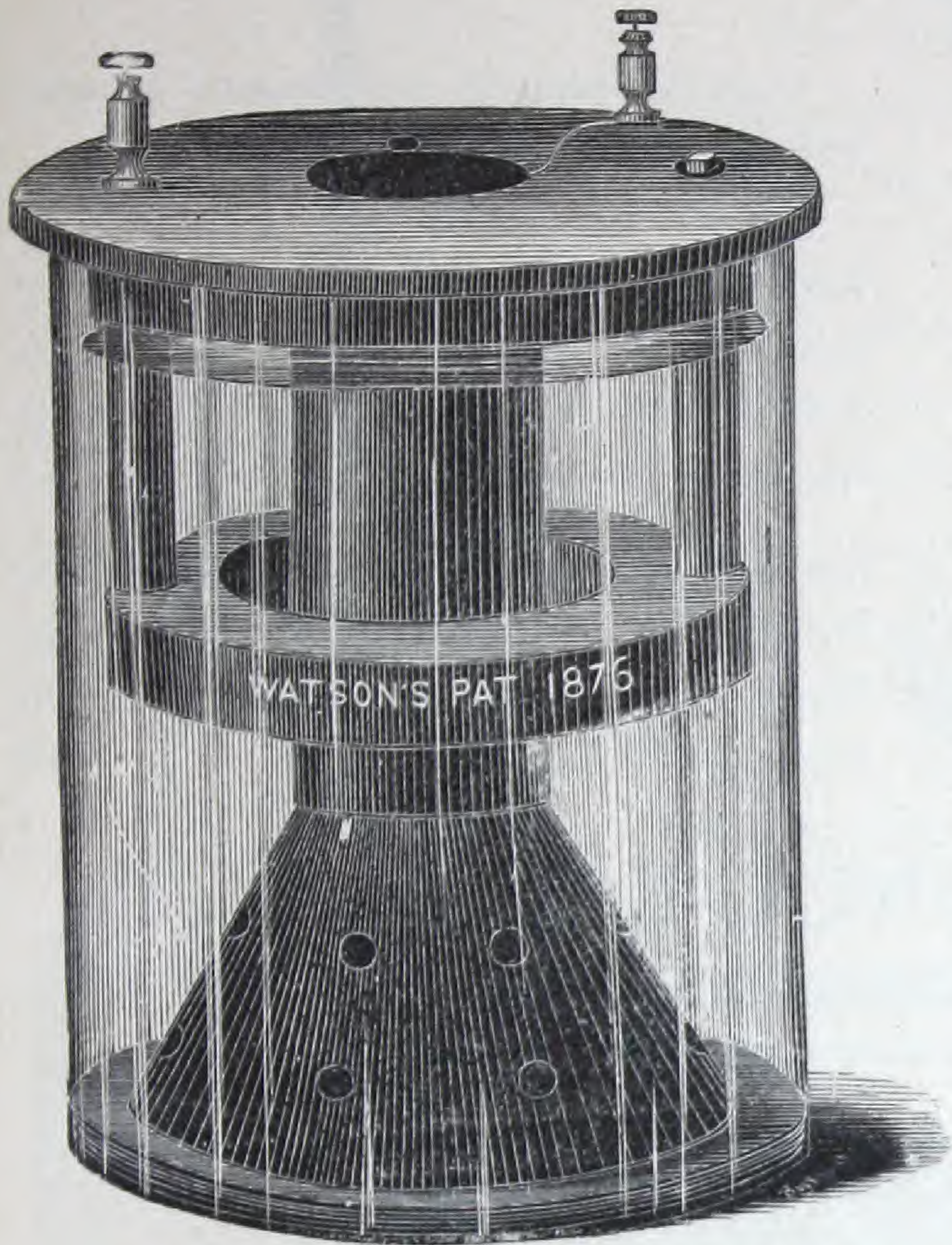
## PRICES.

PARTS.	LARGE SIZE.	SMALL SIZE.
	Jar 6x8 in.	Jar 5x6 in.
Per Cell, complete, with Blue Stone.....	\$ .85	\$ .65
Zincs, each.....	.35	.25
Coppers, each.....	.20	.15
Jars, .....	.30	.25
Copper Connector, (Extra).....	.10	.10
Blue Stone, per lb. (small quantities),		.10
" " " (barrel),		.08



WATSON BATTERY.

FOR CLOSED CIRCUIT WORK.



DIRECTIONS.

Fill the jar nearly two-thirds full with a mixture of one-quarter pound sulphate of zinc to two parts of water; put the tube, zinc, and cover in position as shown in cut; drop into the tube from one-half to three pounds blue vitriol. If the battery is to have only occasional use, the smaller quantity of blue vitriol will answer; if it is to be used steadily, the tube should be filled. If battery is to be used on open circuit, viz: Call Bells, Laboratory uses, etc., add a teaspoonful of acetate of lead to the solution for four cells.

PRICES.

Per Cell, complete.....	\$1.50	Zinc Connections.....	\$ .15
Jars, each .....	.30	Lead Negative, with Connections	.55
Zincs, “ .....	.35	Porcelain Cover, each.....	.15

DANIELLS BATTERY.

FOR CLOSED CIRCUIT WORK.

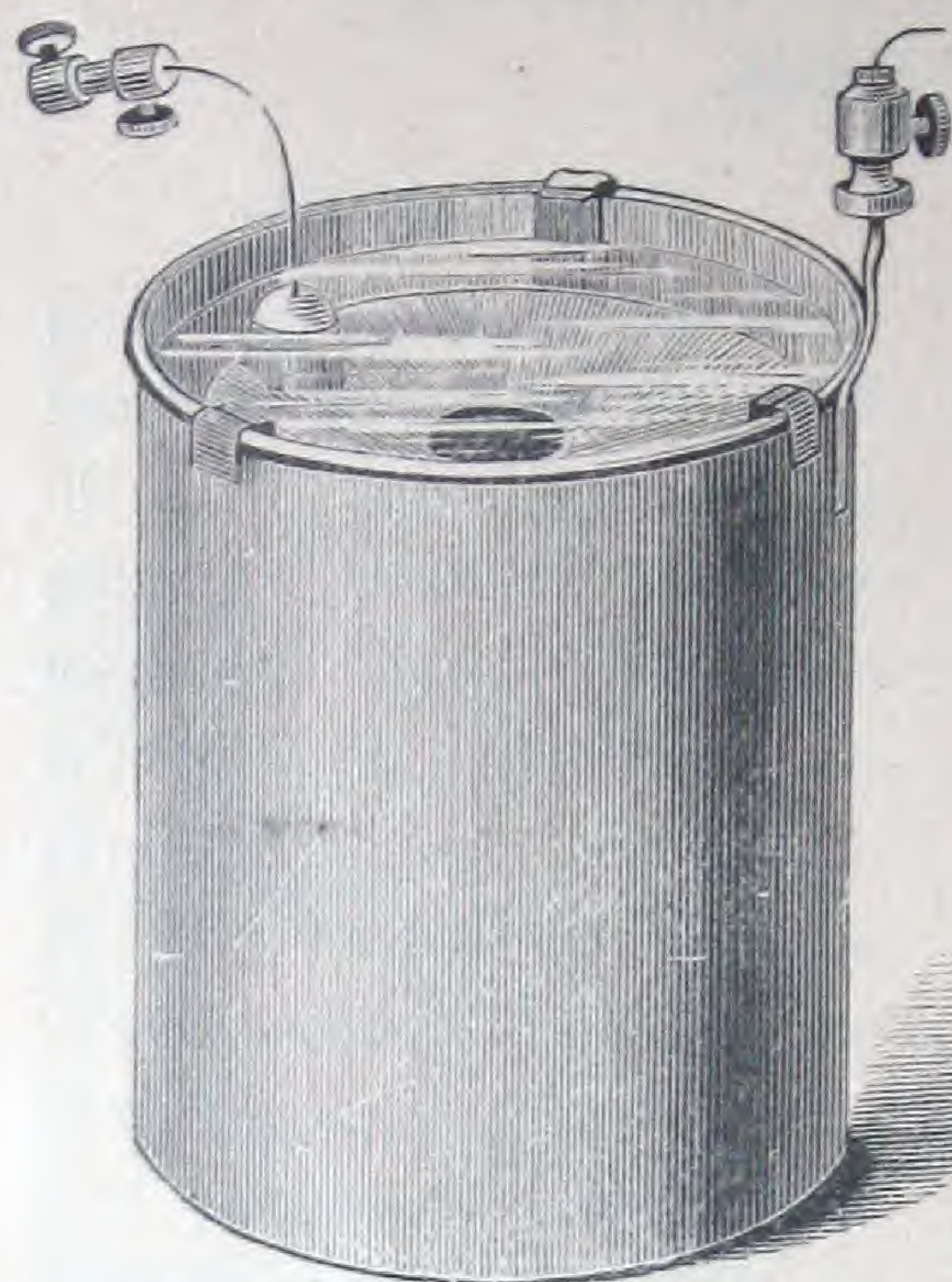
A constant, two-fluid cell, composed of a porous vessel containing the copper plate and the sulphate of copper, with a small store of large crystals to keep the solution saturated. This vessel rests in another nearly filled with a semi-saturated solution of zinc sulphate, in which is placed the zinc plate. The Daniells battery has been constructed in a great variety of forms to suit various purposes.

PRICES.

Per Cell, complete.....	\$1.50	Jars, each.....	.35
Coppers, with Pockets.....	.50	Zincs, “ .....	.35
Porous Cups, each.....	.20	Zinc Clamps, each.....	.20



## EAGLES METALLIC BATTERY.

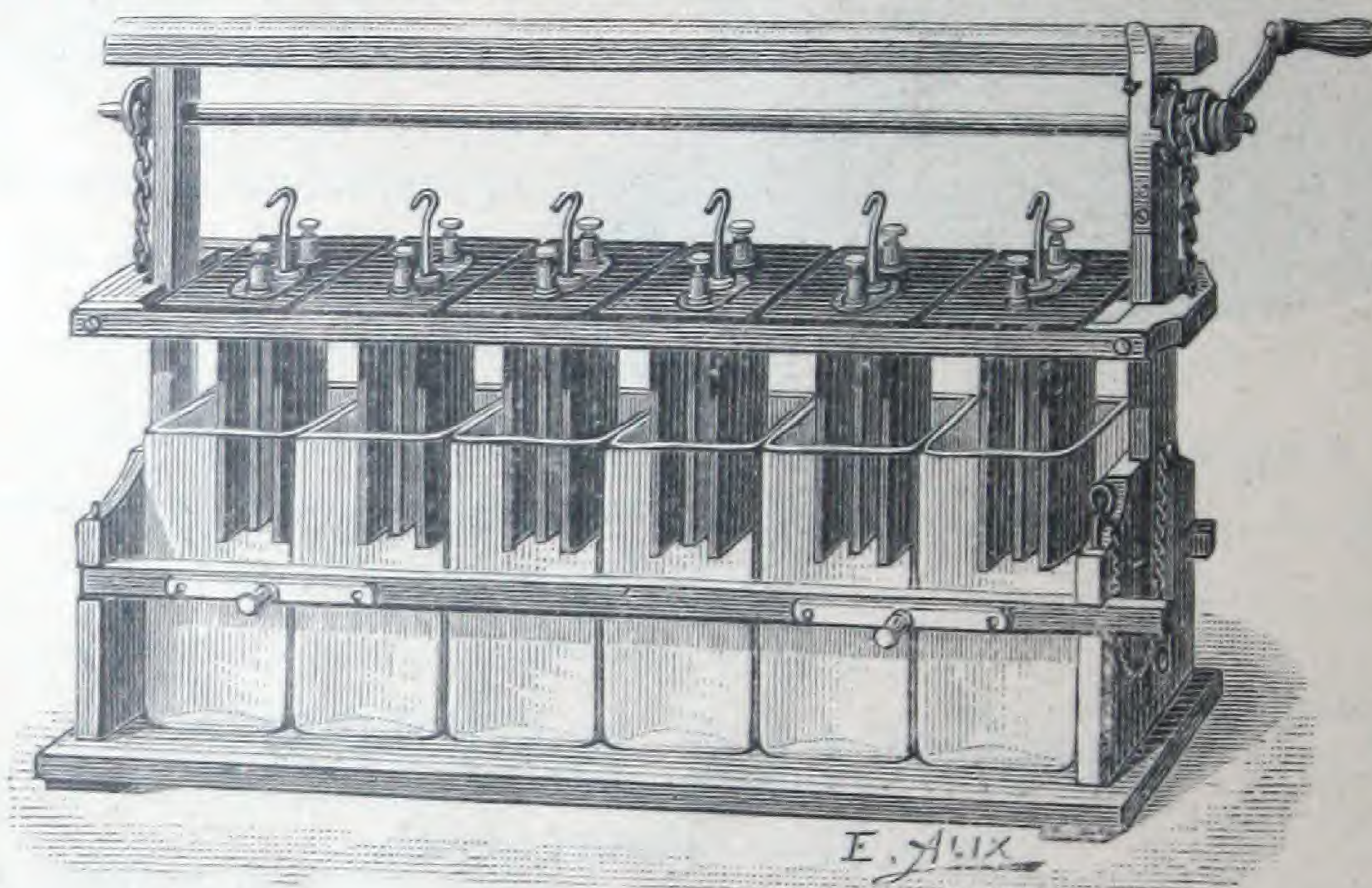


FOR CLOSED CIRCUIT WORK.

Used for running experimental motors, turntables for show windows, etc.

Round Cell, Main, complete, . . . . .	\$1.50
Lead Jar, . . . . .	1.05
Zinc, with wires attached, . . . . .	.35
Insulating Fenders, per set, . . . . .	.12
Square Cell, Local, complete, . . . . .	2.00
Lead Jar, . . . . .	1.45
Zinc, with wires attached, . . . . .	.45
Insulating Fenders, per set, . . . . .	.12

## NEW PLUNGE BATTERY.



On account of its compactness, power, ease of manipulation, simple but perfect arrangement for connecting up, either for the quantity or intensity current, it has become a general favorite for experimental purposes. The connections of this battery are detachable, so any number of cells, from one to six, can be used. It can be arranged either for quantity or intensity.

Great care should be exercised to see that the battery is taken out of the solution immediately after use.

### PRICES.

New Dipping Battery, No. 1, with movable elements, arranged for quantity or intensity; six cells in wood frame, carbons $3\frac{1}{2} \times 1\frac{1}{2}$ inches.....	\$18.00
New Dipping Battery, No. 2, with six cells; carbon plates $5\frac{1}{2} \times 2\frac{1}{2}$ inches; with wheel and ratchet for lifting out of the acid, complete.....	\$35.00



## NOVELTY A. BATTERY.



This cut represents a cell of our Novelty battery (size A.) It consists essentially of two carbons, with a zinc plate between them. It is similar in construction to the well-known Grenet battery, and will produce as strong a current as the ten inch cell of that make, while its cost is much less. When the battery is not in use the zinc is saved by being raised from the liquid. It is held in this position by a small screw shown in cut. The battery may remain in this condition for a long time without attention, and may be placed in service at any moment by loosening the screw and depressing the brass rod which carries the zinc.

### PRICES.

Size A, 8 inches high by 4 inches in diameter.

Battery, complete,	\$1.50
" Jars, without caps,	.25
" Zincs, $6 \times 1\frac{1}{2} \times \frac{1}{4}$ inches,	.15
" Carbons, $1\frac{1}{4} \times 2\frac{1}{4} \times \frac{1}{4}$ inches,	.08



Size C, 4 inches high by  $2\frac{1}{2}$  inches in diameter.

Battery, complete,	\$1.20
" Jars, without top,	.15
" Zincs, $1\frac{1}{4} \times 1 \times \frac{3}{16}$ inches,	.10
" Carbons, $1\frac{1}{4} \times 2\frac{1}{4} \times \frac{1}{4}$ inches,	.08

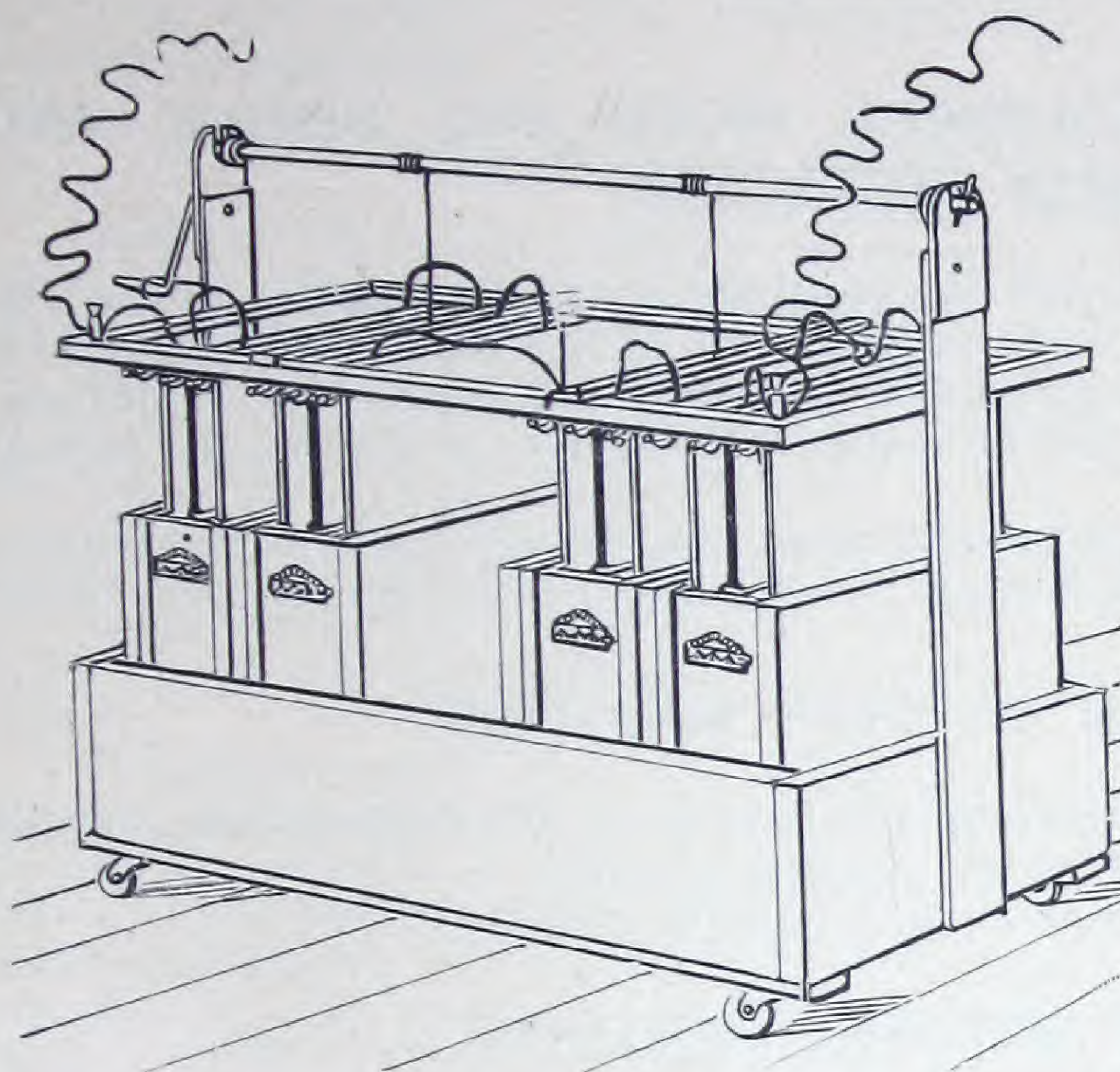






## EDCO PLUNGE BATTERY.

FOR RUNNING MOTORS, ELECTRIC LIGHTS, LABORATORY PURPOSES, Etc.



The Edco battery is a modification of the Bunsen, and possesses many advantages over accumulators, yielding a vast supply of electricity, if required. It can be used either with or without a porous cup. It is composed of a number of portable cells, 13x20x7 $\frac{1}{4}$  in., each one holding elements 12x12 in. It has a lead-lined trough, and a device for lifting and lowering the elements by which the current can be instantly stopped. Glass does

not enter into its manufacture, and the danger of breakage is therefore entirely avoided.

### PRICES.

Two Cell Battery, with Lifting Attachment,	\$15.00
Six " " " Ratchet Lifting Attachment,	50.00

## LARGE PLUNGE BATTERIES.

3 and 5 CELLS EACH. 4 CARBONS AND 3 ZINCS IN EACH CELL. FOR OPERATING INDUCTION COILS, 4 TO 10 INCH SPARK.

Each cell contains a large carbon surface, giving an enormous power.

### PRICES.

Three Cells, complete, plates 6x9 inches,	\$35.00
Five " " " " " "	50.00
Carbons, each,	.50
Carbon Hangers, each,	.30
Glass Jars,	.75
Zincs,	.60
Zinc Hangers,	.30

NOTE.—Plunge batteries of every size and description made to order as required.



## Directions for Setting Up and Maintaining Batteries.

### NOVELTY DISQUE, LECLANCHE PRISM AND DISQUE, AND NEW LAW PRISM.

Put 6 ounces sal ammoniac into the glass, fill one-third of pure water and stir. Put in the porous cell and fill with water to neck of jar, pour a few spoonfuls of water into the holes in the porous cell, put in the zinc and connect up the battery. The inside rim of the jar should be coated with beeswax or paraffine to prevent salts from over-running.

The battery should be kept in a dry place, and does not require any attention to maintain, except to add a little water occasionally to supply loss by evaporation.

### BUNSEN BATTERY SOLUTION.

Put strong nitric acid in porous cell, fill outside jar with sulphuric acid, diluted with water, seven parts of water to one of sulphuric acid.

Electropoion fluid can be used in place of nitric acid if desired.

### GROVE BATTERY SOLUTION.

Fill the porous cup with strong nitric acid and the glass jar with dilute sulphuric acid, about twenty parts of water to one of acid. When not in use, the plates should be removed from the jar and the nitric acid emptied out.

### FULLER MERCURY BICHROMATE, AND ORNE BATTERY SOLUTION.

Amalgamate the zinc and its copper rod in the usual way.

Place the zinc in the porous cell and then pour into the latter a tablespoonful of mercury. Then fill the porous cell with water to within about two inches from the top.

Place the porous cell and the carbon in their positions in the jar, as shown in the cut of the battery. Then fill the jar to within two, or two and a half inches of the top, with a mixture of three parts of electropoion fluid to two parts of water.

The zinc should be lifted out occasionally and the sulphate washed off. Keep a supply of mercury in the porous cell so as to have the zinc always well amalgamated. If the battery does little work it will last three or four months without being touched.

To renew, clean all deposits from carbon and zinc and set up with fresh solutions as above.

### SMEE BATTERY SOLUTION.

The liquid used to charge this battery is diluted sulphuric acid—about one part acid to ten parts water.

### CARBON BATTERY SOLUTION.

Fill the glass jar with water; the porous cell with electropoion fluid. The height of the liquid in the jar and porous cell should be about the same.



**CARBON BATTERY, EXTRA SIZE FOR NICKEL-PLATING.**

In the porous cell use a mixture of equal parts, by measure, of sulphuric acid and water, with two ounces of nitric acid. In the outer jar use a mixture of twelve parts water to one part sulphuric acid. When the liquid in the outer jar becomes milky, use fresh solution. Add a little nitric acid occasionally to porous cell. Keep zinc well amalgamated.

**CROW FOOT GRAVITY BATTERY.**

Open out the copper, spread it out so as to present all of its surface to the action of the solution, place it in the bottom of the jar, run the insulated wire out of the top of the jar for connecting up.

Suspend the zinc above the copper by hanging the hooked neck on the rim of the glass. The neck of the zinc is provided with a connecting clamp to receive the wire from the copper of the next cell.

Pour clean soft water into the jar until it covers the zinc, then drop in 6 or 8 ounces of copper sulphate (or blue vitriol) in small crystals.

To hasten the action of the battery, dissolve 2 or 3 ounces of zinc sulphate (or white vitriol) in as many ounces of water, and gently pour it on top of the copper solution.

Connect the battery then, (for ordinary purposes,) zinc of one cell to copper of the next, and so on; finally connect the two electrodes of the series and let them so remain for a few hours, until the separation of the two solutions, which will be known by the blue observed in bottom of copper solution; this blue line should be maintained midway between the zinc and the copper; when the "blue line" is too low, drop in a few crystals of copper sulphate; if it is too high, connect the battery in short circuit as before described until it goes down, or reach down with syringe and draw out some of the copper solution and add zinc solution or fresh water.

As long as the battery remains in action there is an increase in quantity of zinc sulphate solution in the upper part of the jar.

The specific gravity of this solution should be maintained at 25 degrees; when the hydrometer indicates a lower degree there is too little zinc sulphate solution; when a higher degree than twenty-five there is too much zinc sulphate, and a portion of it must be taken out, and that remaining must be diluted with pure water.

A hydrometer is essential to properly maintain a large battery.

When zinc oxide forms on the surfaces of the zinc it must be taken out and washed in clean water with a brush.

**DANIELLS BATTERY.**

Fill the jar and porous cell with water and the pocket with copper sulphate. The directions for Gravity or Callaud battery will apply to the maintenance of the Daniells.

**NOVELTY A. & C., AND GRENET BATTERY SOLUTION.**

**TO MAKE SOLUTION.**—To three pints of cold water add five fluid ounces of sulphuric acid; when this becomes cold, add six ounces (or as much as the solution will dissolve) of finely pulverized bichromate of potash. Mix it well.

**TO CHARGE THE BATTERY.**—Pour the above solution into the glass cell until it nearly reaches the top of the spherical part; then draw up the zinc and place the element in the cell. The fluid should not quite reach the zinc when it is drawn up.

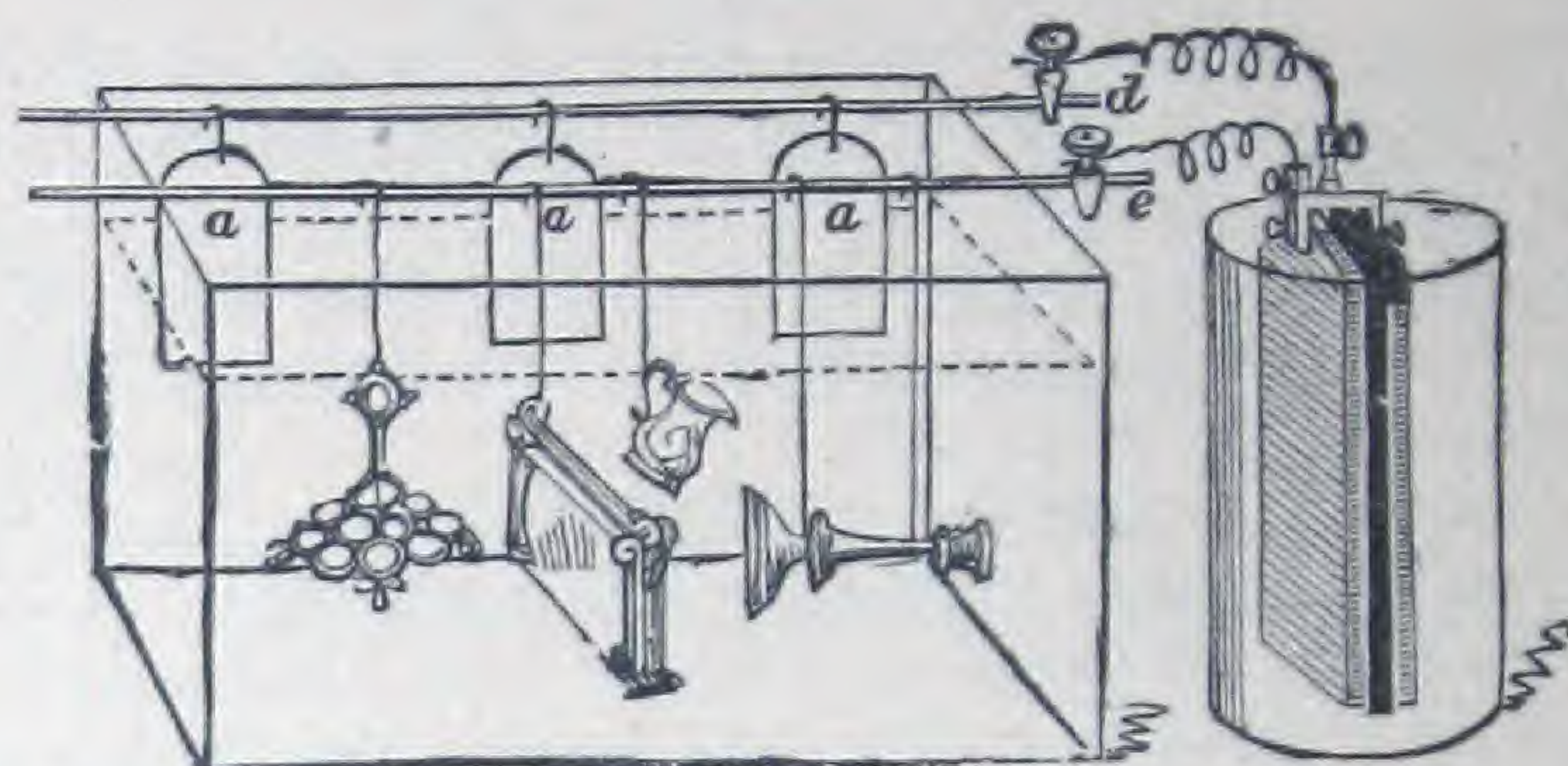
**DIRECTIONS FOR MAKING ELECTROPOION FLUID.**

Mix one gallon sulphuric acid and three gallons of water. Then in a separate vessel dissolve six pounds bichromate of potash in two gallons of boiling water, mixing the whole thoroughly together. When cold it is ready for use.



## ELECTRO-PLATING.

Electro-plating is an art or business that can BE READILY ACQUIRED by any person of ordinary intelligence. A little patience and practice will so perfect a person in the business that they can do as good a job of electro-plating as could be desired.



The engraving above represents the operation of plating, the position of the Anode and Cathode, the Battery and the Bath. The Battery has its centre or positive plate connected to a rod extending across the trough, to which are suspended the Anodes, *a, a, a*, of gold, silver or copper, or whatever metal you may wish to obtain a deposit from. The other plates of the Battery, or the negative elements, are connected with the remaining rod across the trough, to which are suspended the articles to be plated, *b, b, b*.

### AMATEUR'S OUTFIT FOR SILVER-PLATING.

2 No. 1 Smee Batteries,.....	\$6.00	1 Sand Brush.....	\$ .45
1 Extra Glass Cup,.....	.50	1 Fine Brush.....	.45
2 Rods, 18 in. long, with connections	1.00	3 Burnishers, assorted.....	3.00
2 ten feet Conducting Wires,.....	.20	1 Pound Hanging Wire.....	.60
1 Book of Instructions.....	1.00	1 Box of Pumice Stone.....	.25
1 Glass Funnel,.....	.65	1 " Whiting.....	.25
$\frac{1}{2}$ Pound Quicksilver.....	.40	1 " Rouge,.....	.50
1 Glass Rod.....	.25	1 " Crocus.....	.25
1 Graduate Glass.....	.60	1 Quart Silver Solution.....	2.50
1 Scratch Brush.....	1.00	1 Silver Anode.....	1.00
Complete Outfit,.....			\$20.00

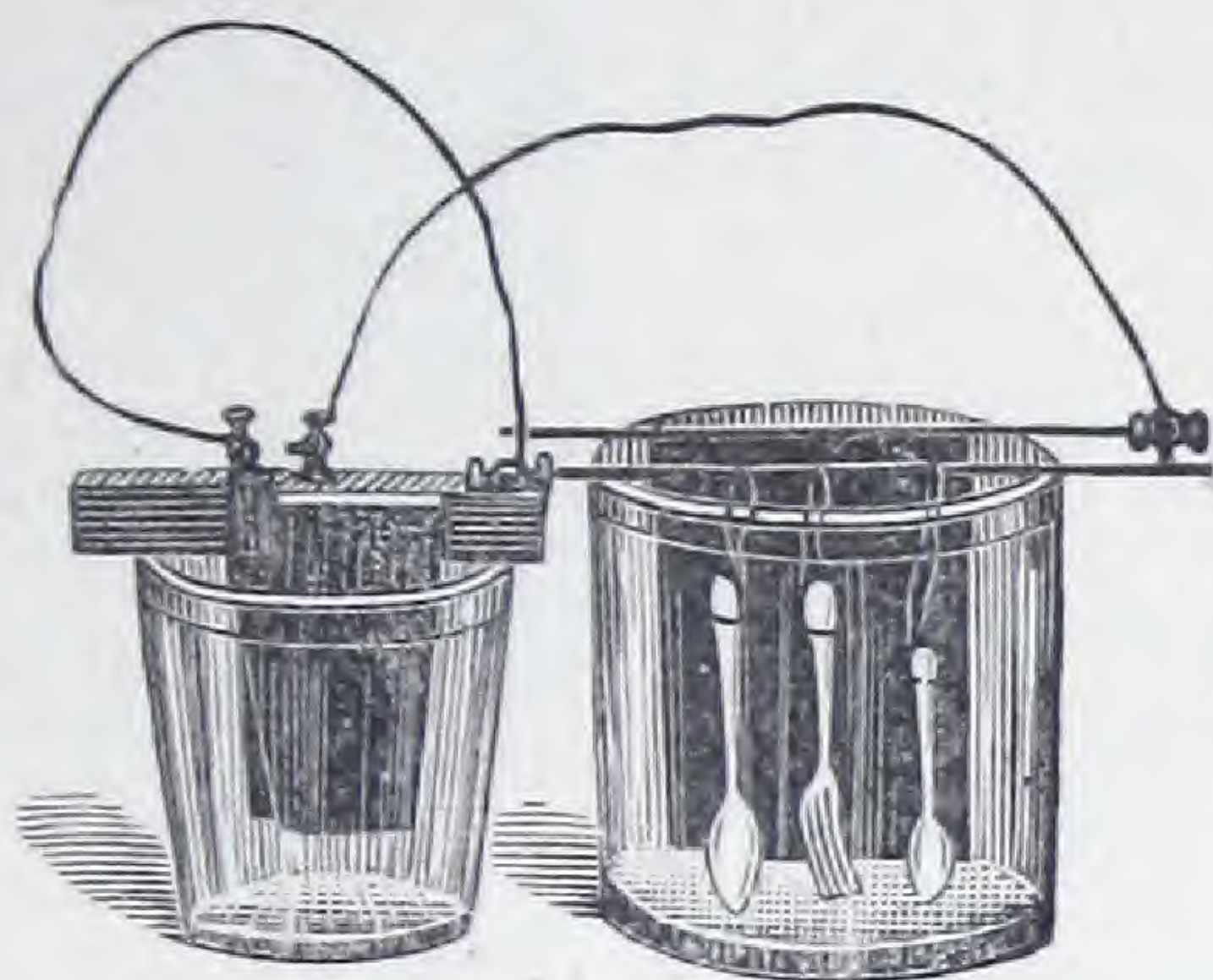
### BRUSHES.

Platers' Washout Brushes, Straight Handle.....	\$ .40
" " " Curved.....	.40
" " " Bent.....	.45
Jewelers' " " Wood.....	.50
" " " Bone.....	.50
Bench Brush Wood.....	.25
Sawdust " Bone.....	.50
Scouring ".....	.50



## SMEE PLATING BATTERIES.

For Experimental use by Amateurs. For Depositions of Gold, Silver, Nickel, Copper, &c.



SET No. 1.—This is the smallest kind of Smees battery manufactured; it has two zinc plates  $3\frac{1}{2} \times 2\frac{1}{2}$  inches, and carbon centre placed in a glass tumbler, with brass binding posts. With this battery is given a white flint glass jar 4x4 inches, for holding the solution, two brass rods for connecting the battery wire, sufficient sulphate of copper to make a saturated solution.

Price, \$2.00.

SET No. 2.—Same as above, with the addition of  $\frac{1}{4}$  lb. best prepared wax, one ounce best plumbago, one soft brush. Packed in box.

Price, \$2.50.

SET No. 3.—Same as above, but with one quart of silver solution, one piece sheet silver and one hard brush, substituted for the plumbago, wax and soft brush. Packed in box.

Price, \$3.50.

## TRAVELING PLATER'S SET.

2 Bunsen batteries, 1 extra glass cup, 2 extra porous cups, 2 rods 24 in. with cups, 2 twelve ft. conducting wires, 1 Book of Instructions, 1 glass funnel,  $\frac{1}{2}$  lb. quicksilver, 1 pair scales, 1 graduate glass, 1 scratch brush, 1 sand brush, 1 fine brush, 1 burnisher, 1 lb. wire, 1 box pumice stone, 1 box whiting, 1 box rouge, 1 box crocus. Securely packed and sent to any address on receipt of price.

Price, \$5.00.



## ESTIMATES FOR NICKEL-PLATING OUTFITS.

Nickel-plating is attracting considerable attention at the present time, and is much better adapted for many articles than silver, and can be produced at about the same cost.

We annex a few estimates based on present prices, which will be adjusted to suit market.

### AMATEUR OUTFIT, - - - - - \$10.00

One of our Nickel Batteries.  
One Glass Jar for Solution.  
Nickel Salts for Jar of Solution.  
Two small Nickel Anodes for Jar of Solution.

### 20 GALLON OUTFIT, - - - - - \$50.00

Twelve gallons Nickel Solution in Carboy, or Salts if at a distance or too cold to ship Solution.  
Square Glass Tank.  
One of our Nickel Batteries.  
Three Nickel Anodes, about 70 square inches or five pounds Rods and Connections.  
If Wood Tank, lined with Asphalt, \$5.00 less.

### 50 GALLON OUTFIT, - - - - - \$100.00

Nickel Solution in barrel, or Salts.  
Two-inch Wood Tank, iron braced and lined, of any proportion desired.  
Two of our Nickel Batteries.  
Six Nickel Anodes, 25 pounds.  
We pack in the Tanks, saving freight.

### 100 GALLON OUTFIT, - - - - - \$200.00

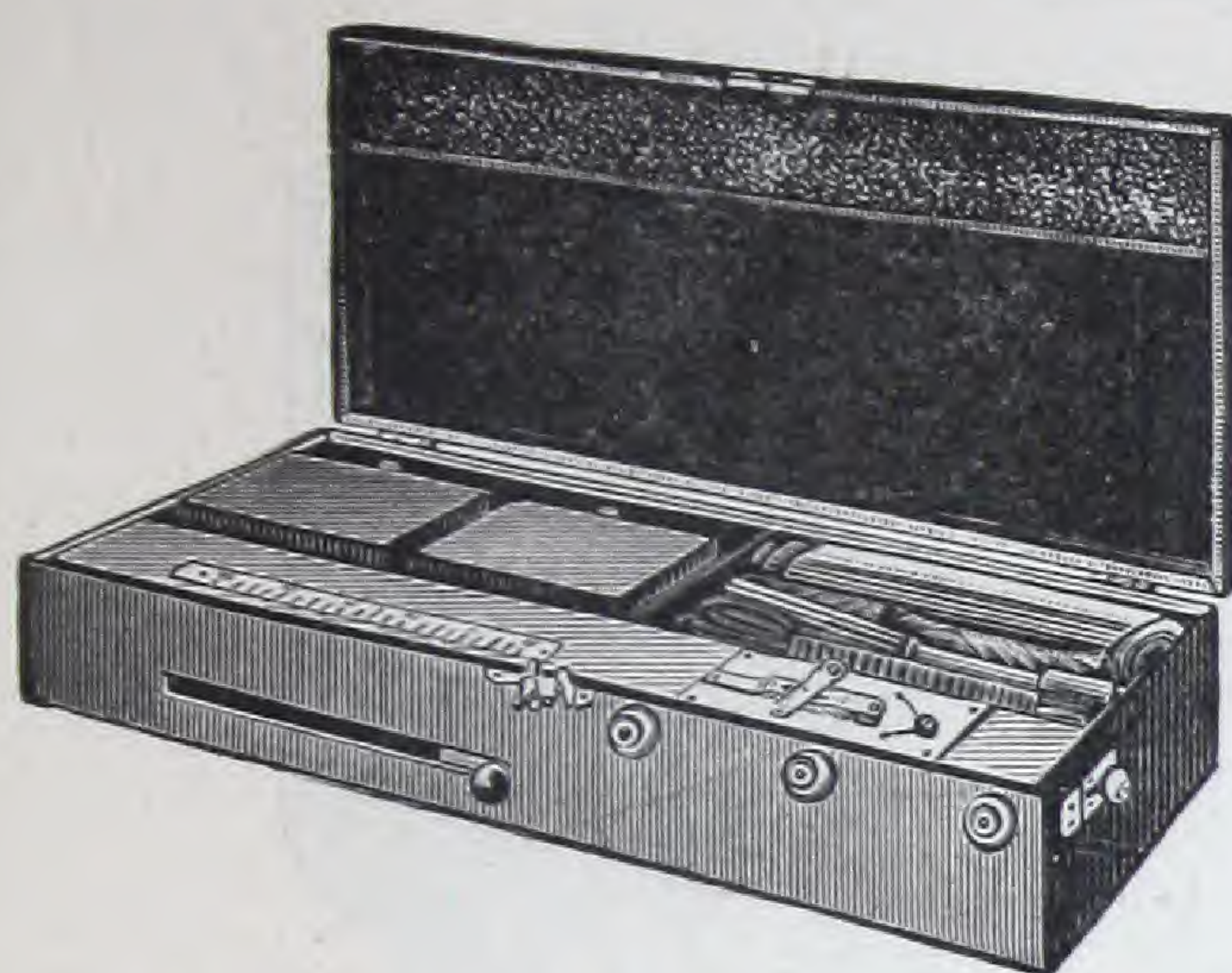
Nickel Solution in barrel, or Salts.  
Two-inch Wood Tank, iron braced and lined, of any proportion desired.  
Twelve Nickel Anodes, 5x8 inches, for two Rows, 50 pounds.  
Resistance Coil. Hydrometer, etc., etc.  
Samples Polishing Material, etc., etc.  
Four of our Nickel Batteries.

Full directions furnished with above.



# MEDICAL BATTERIES.

## CLOSED CELL POCKET BATTERY.



Combining improvements of so radical a nature as to make it the best Pocket Medical battery upon the market.

Manufactured in two sizes—

No. 1—6 in. long,  $3\frac{1}{2}$  in. wide, and  $1\frac{1}{2}$  in. high.

No. 2— $7\frac{1}{8}$  in. long,  $3\frac{7}{8}$  in. wide, and  $1\frac{1}{2}$  in. high.

These sizes admit of their being easily and comfortably carried in the pocket.

The cells are absolutely air- and acid-tight, thus enabling the operator to carry the battery in any position, charged and ready for immediate use.

They have a current so *mild* that it cannot be felt excepting by the most sensitive, and yet be gradually increased by one so *strong* as to fully meet the requirement of any medical demand.

The disagreeable jerk, or electric “thump,” so characteristic of many batteries, is not found in these, but a current that is nowhere excelled for its *fineness*, *smoothness* and *agreeableness*.

The cell will give ten to twelve hours' work, and can be used from day to day, until that much electric energy is consumed upon the *same charge of Bisulphate Mercury* used to get one hour's work out of a once popular Electric machine; there is no question as to the claim of *economical working*.

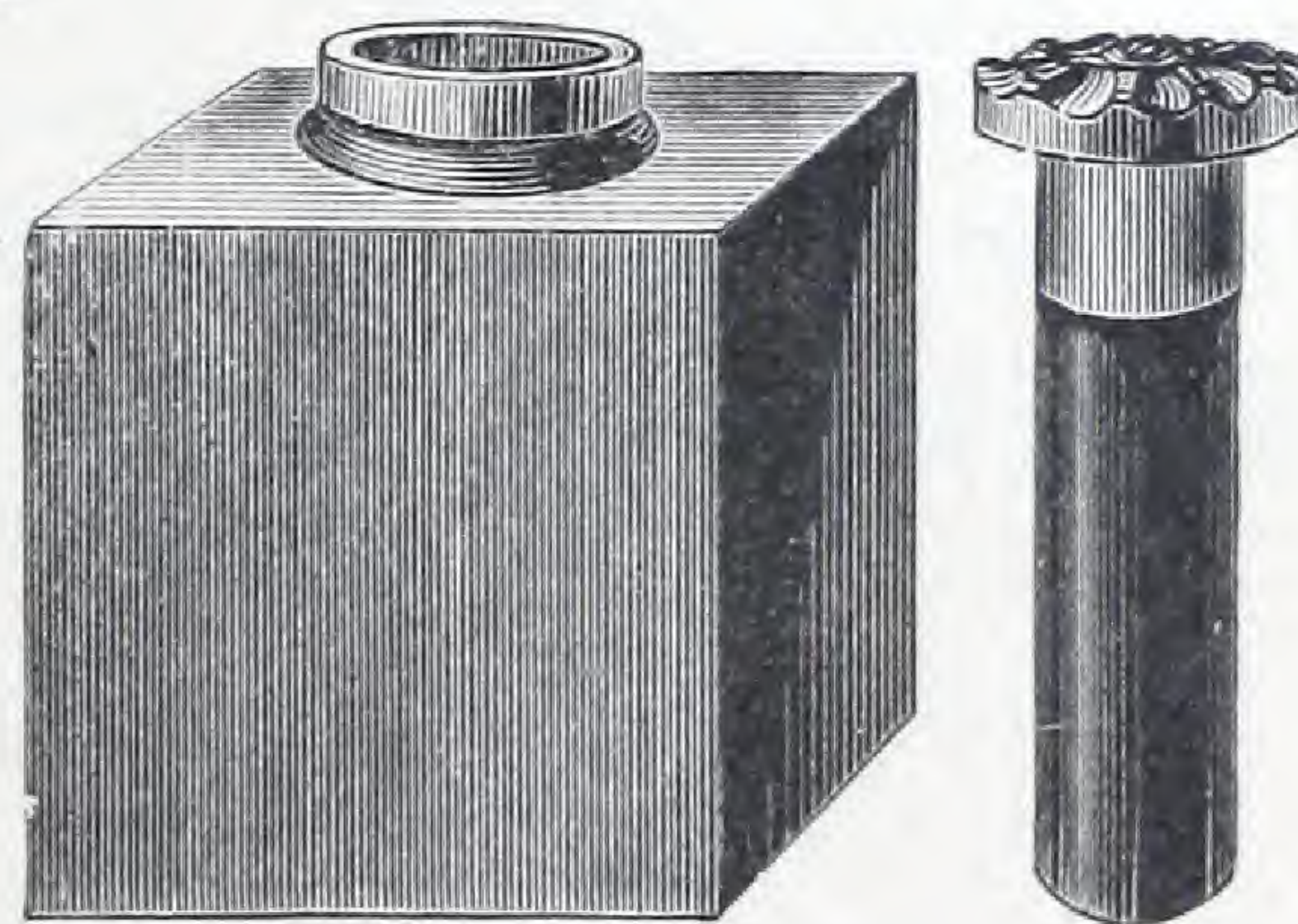
The *Pole-cords* are attached on the *outside of the box*; the *Graduator* is *outside*, most handily placed, and cannot fall out; the “*Cut-off*,” for “*making*” and “*breaking*” circuit is *also outside*.

The boxes are Mahogany or Black Morocco.

The *Induction Coil*, of best copper wire, carefully wound and properly proportioned to produce the best effect.

The *Cells* are of hard rubber with carbon chamber, charged with a solution of *Bisulphate Mercury*, into which a zinc rod is immersed. The zinc rod has a rubber head fitting tightly into the neck of the cell, making the whole *air-tight* and *acid-tight*.

Printed directions accompany each battery.

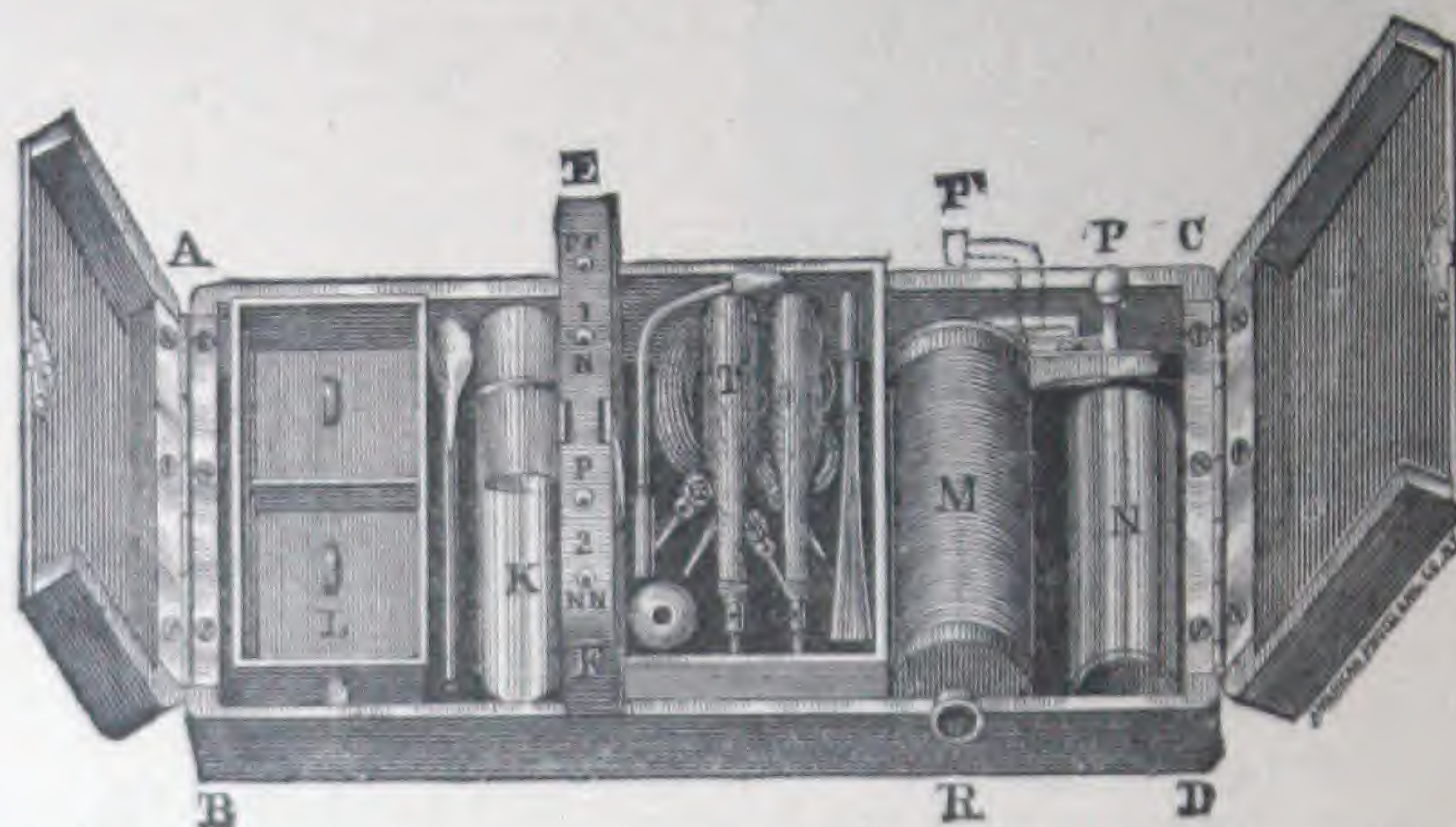


### PRICES.

No. 1.....	\$7.50	Zinc Rods, with Stopper.....	\$ .25
No. 2.....	10.00	Pole Cords, per pair.....	.75
Cells, each.....	1.50	Mercury, per oz., 10c.; per lb.....	1.25



## GAIFFE POCKET MEDICAL BATTERY



A. Gaiffe's celebrated Electro-Medical Induction apparatus for physicians and family use, with Bisulphate of Mercury Battery, conveniently and portably arranged in a folding mahogany case, highly polished. The currents produced are as follows: 1, Primary current; 2, Secondary current; 3, The current of the first two combined in intensity; 4, Shocks, slow or fast, according to the use of the contact breaker or lever.

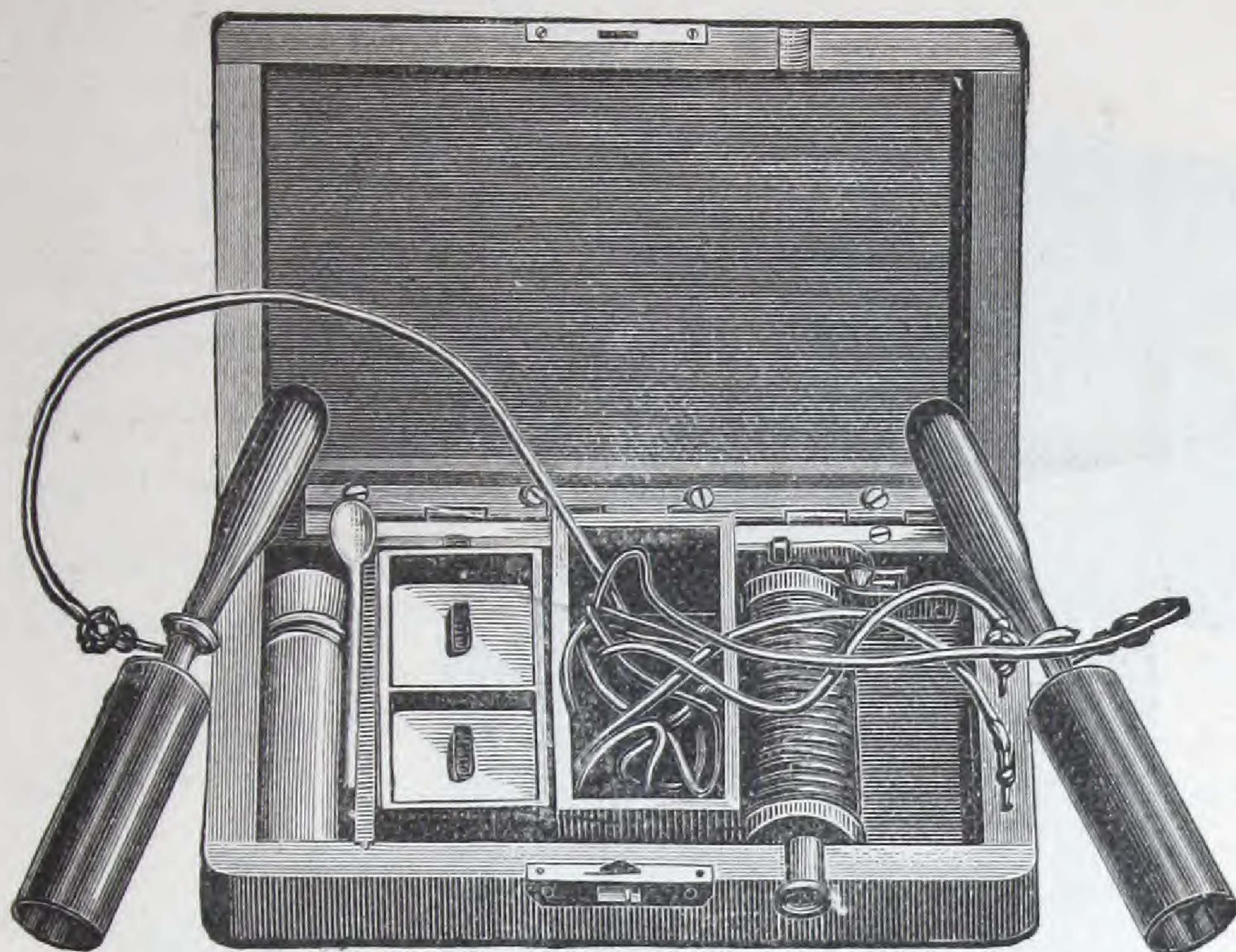
Each instrument contains, viz: Two Insulated Handles, one pair Sponge Holders, one olive-shaped Exciter, one Spherical Exciter, one Metallic Brush.

### PRICES.

Size of Case, $7\frac{1}{2} \times 4$ ,	\$10.00
" " $8\frac{1}{2} \times 4\frac{1}{2}$ ,	16.00

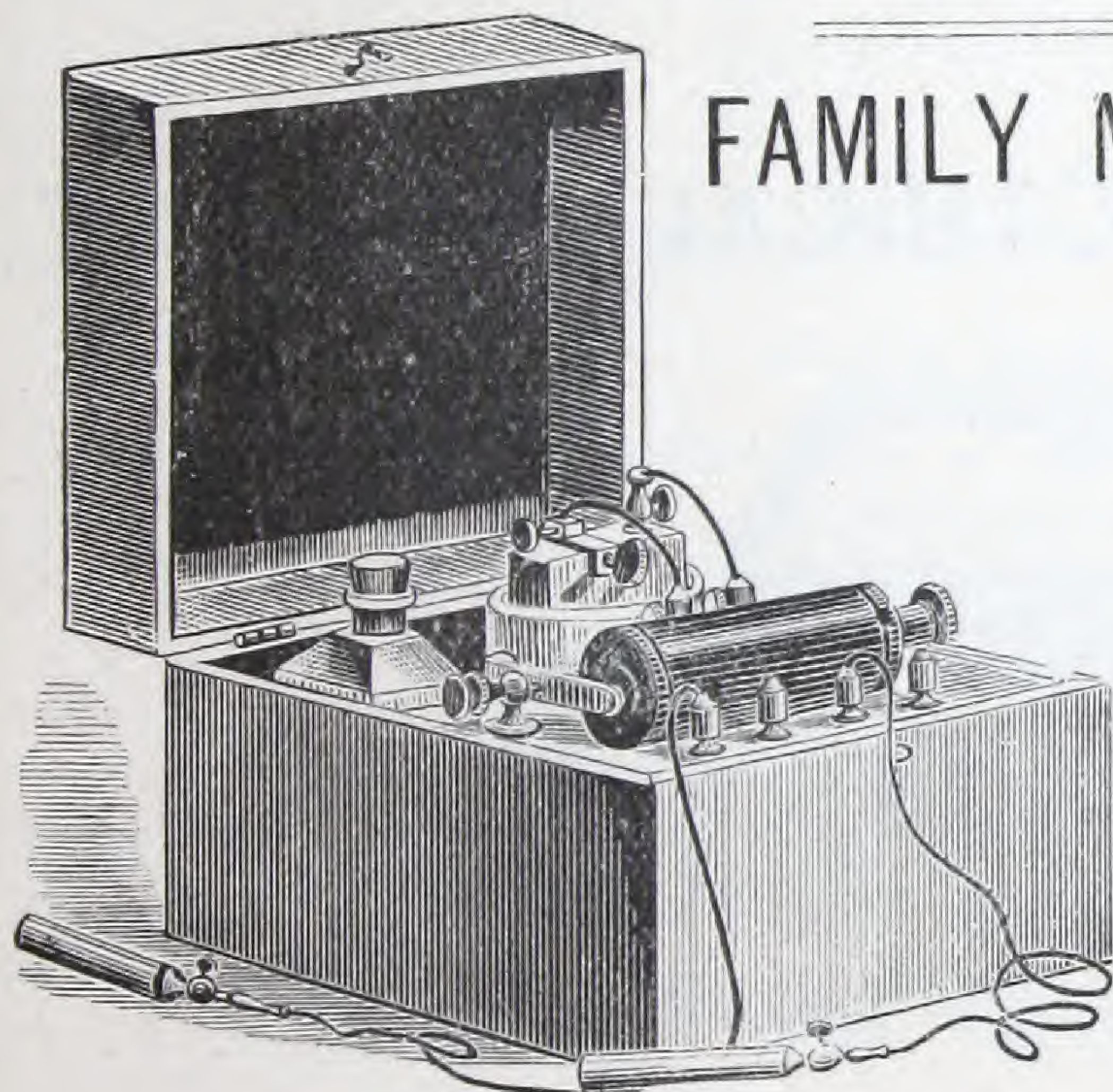


## GAIFFE POCKET MEDICAL BATTERY.



Same as on preceding page, except being smaller, and not so highly finished.

Price, complete, \$6.50.



## FAMILY MEDICAL BATTERY.

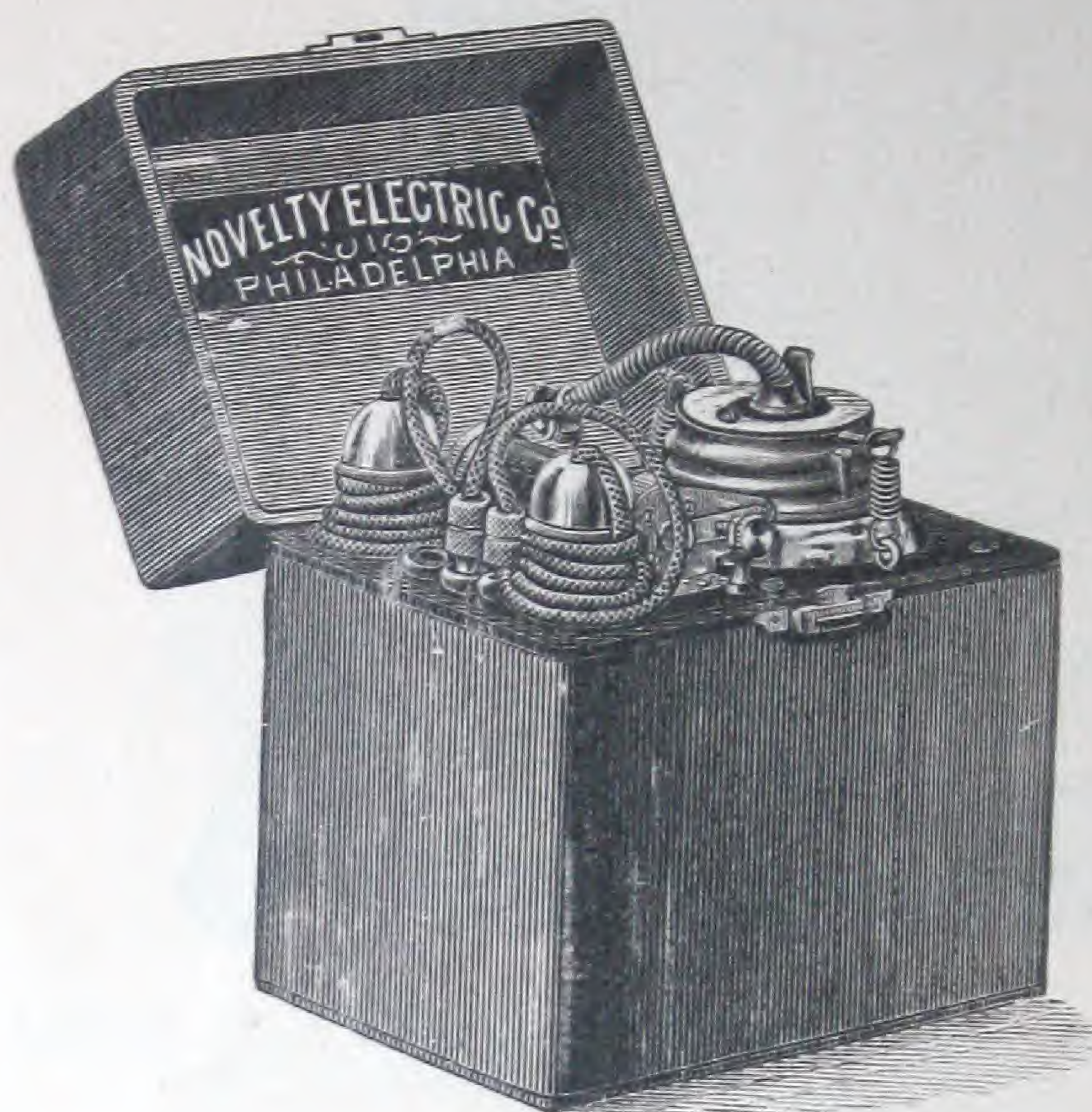
This instrument is elegantly nickel-plated, and enclosed in a finely-finished walnut box, with cords, handles, and battery, with full instructions for use and application to almost every variety of disease.

### Price-List of Apparatus and Appliances.

Electro-Medical Apparatus, complete, nickel-plated.....	\$10 00	Extra Cords, with tips, per pair.....	\$ 50
Extra Battery, per cell, complete.....	2 00	“ “ without tips, per foot.....	5
“ Zincs, per pair.....	50	“ Handles, brass, per pair.....	50
“ Platina Plate.....	1 00	“ “ nickel-plated, per pair.....	75
“ “ with Wood and Binding.....		“ Bottles for holding fluid.....	7
“ Post.....	1 25	Complete set of Appliances, all heavy electro-plated, in fine Morocco Case.....	15 00
“ Zinc Clamp.....	25	Sponge Holders, fine finished, wood, each.....	75
“ Glass Jar.....	10		



## HOME MEDICAL BATTERY.

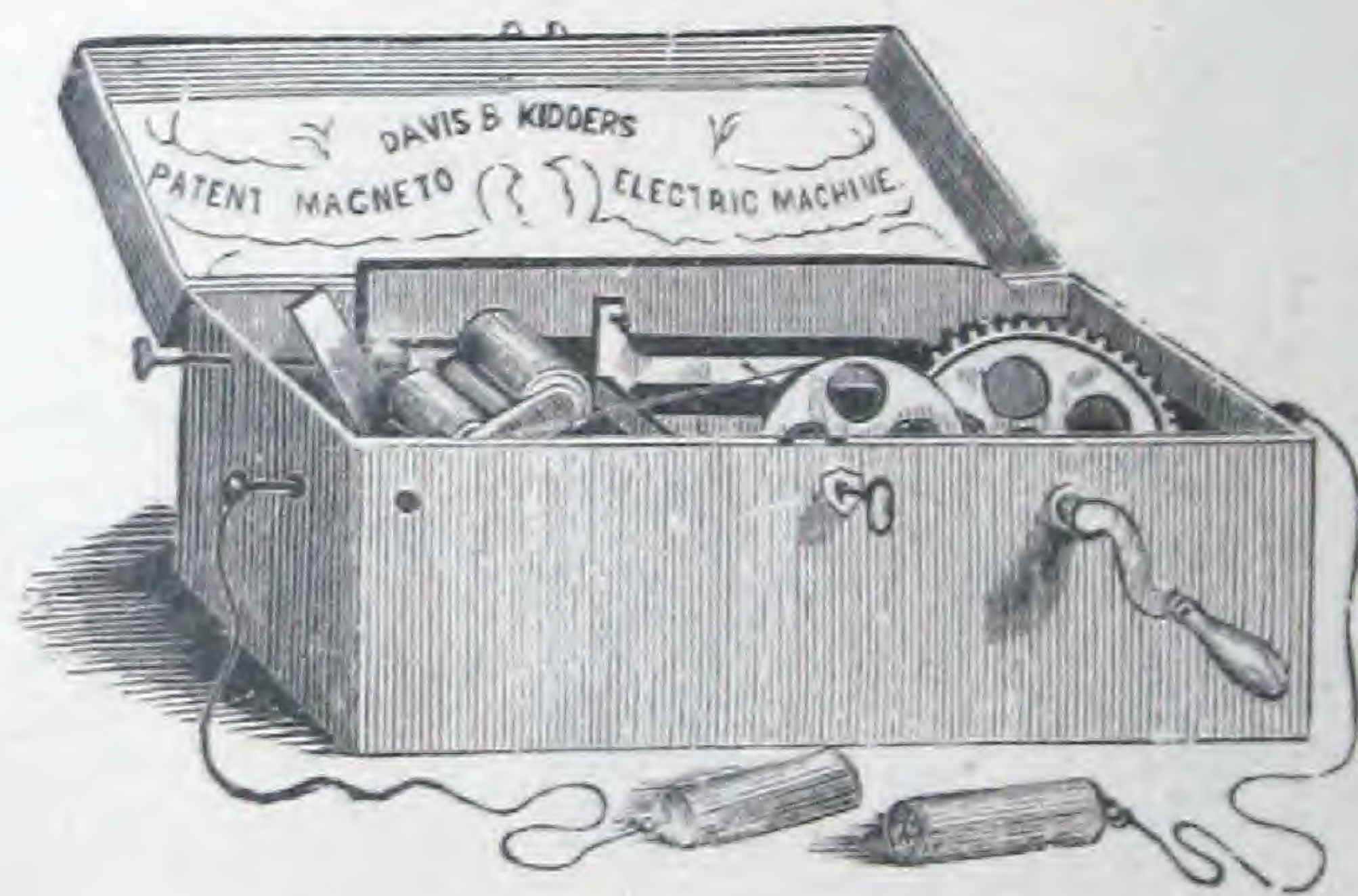


A complete and handsome Three-Current Electro-Medical battery, consisting of a powerful induction coil and best form Grenet battery, connecting cords, plated handles, insulators and fluid.

### PRICES.

Complete,	\$6.50
Extra Battery, per cell,	2.00
“ Zincs,	.25
“ Carbons,	.30

## MAGNETO-ELECTRICAL MACHINE.



A powerful form of Medical Battery; no chemicals used. The electrical current is generated by simply turning the handle.

Complete in Finished Case, \$8.00.



# BATTERY MATERIAL.

## POROUS CELLS.

### Style A. Round Porous Cells.

Outside Measure,	$1\frac{1}{4} \times 2\frac{1}{2}$ , $2 \times 3$ , $1\frac{1}{2} \times 3\frac{1}{4}$ , $2 \times 3\frac{3}{4}$ , $2\frac{1}{2} \times 3\frac{3}{4}$ , $2\frac{1}{8} \times 4\frac{3}{4}$	inches.
Price per doz.,	\$1.25 \$1.25 \$1.25 \$1.30 \$1.40 \$1.75	
Outside Measure,	$2\frac{1}{8} \times 4\frac{7}{8}$ , $2 \times 4\frac{1}{4}$ , $2\frac{5}{8} \times 5\frac{3}{8}$ , $2\frac{3}{4} \times 7$ , $3\frac{1}{8} \times 7\frac{1}{4}$ , $3\frac{1}{8} \times 8$	inches.
Price per doz.,	\$2.00 \$1.75 \$2.00 \$2.25 \$2.40 \$3.00	
Outside Measure,	$4 \times 11\frac{1}{8}$ , $3 \times 5\frac{1}{2}$ , $6 \times 6$	inches.
Price per doz.,	\$9.00 \$2.00 \$9.00	

### Style B. Round Porous Cells, with Flange Top.

Outside Measure,	$1\frac{5}{8} \times 4$	inches.
Price per doz.,	\$1.50	

### Style C. Flat Porous Cells, with Straight Sides.

#### OUTSIDE MEASURE.

Inches Wide	Inches Long.	Inches High.	Per Doz.
1	$2\frac{3}{4}$	5	\$2.50
1	$3\frac{1}{16}$	$5\frac{1}{2}$	3.00
$2\frac{1}{8}$	$5\frac{7}{8}$	$7\frac{1}{4}$	7.20

### Style D. Flat Porous Cells, with Flange Tops.

#### OUTSIDE MEASURE.

inches Wide.	$2\frac{5}{8}$ Inches Long.	$4\frac{1}{2}$ Inches High.	Per doz., \$3.00
"	$3\frac{1}{2}$ "	$5\frac{1}{2}$ "	" 3.60

### Style E. Large Oval Shape Porous Cells.

#### OUTSIDE MEASURE.

$2\frac{3}{4}$ In. Wide in Centre.	$5\frac{3}{4}$ In. Long.	$6\frac{3}{4}$ In. High.	Per doz., \$7.50
$3\frac{1}{8}$ " " "	9 " "	$9\frac{3}{8}$ " "	" 12.00

### Style F. Half Round Porous Cells.

#### OUTSIDE MEASURE.

$1\frac{3}{4}$ In. Diameter at Centre.	3 In. Long.	4 In. High.	Per doz., \$3.00
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### Style G. Round Shallow Porous Cells.

#### OUTSIDE MEASURE.

$5\frac{3}{8}$ Inch Diameter.	$2\frac{1}{2}$ Inches Deep.	Per doz., \$3.00
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**BATTERY MATERIAL—Continued.****GLASS BATTERY JARS.****Style A. Round Battery Jars, Inside Measure, 17 Sizes.**

Size, Inches.	Per Dozen.	Size, Inches.	Per Dozen.	Size, Inches.	Per Dozen.
2½x3 .....	\$1.25	4½x4½ .....	\$2.50	6x8 .....	\$3.60
2¾x3 .....	1.50	4½x6 .....	3.00	6½x6 .....	4.00
3¼x4½ .....	2.00	5x6 .....	3.00	6½x7 .....	4.00
3¾x5¾ .....	2.25	5x7 .....	3.00	7x10 .....	8.00
4x4 .....	2.50	5x11 .....	6.00	7x12 .....	9.00
4x5 .....	2.50	5½x8 .....	3.60		

**Style B. Bottle Shape Jars, Outside Measure.**

Diameter of Neck.	Diameter of Bulb.	Height.	Per Doz.
No. 1, 1⅝	3¼	5⅝	\$3.00
" 2, 1⅝	4	6	4.00
" 3, 2⅜	5	9	5.00
" 4, 2⅝	6	10	6.00

**Style C. Wide Mouth Bottle Jar, one size.**

Diameter of Neck.	Diameter of Jar.	Height.	Per Doz.
2	4⅝	5½	\$3.50

**Style D. Square Bottle Shape Jars, Outside Measure.**

No. 1,	Neck 1¼x1¼	Jar 3x3	Height 4½	dozen, \$4.00
No. 2,	" 2x2	" 4x4	" 4⅝	" 6.50

**Style E. Small Rectangular Shape Jars, Outside Measure.**

Inches wide.	Inches long.	Inches high.	Per dozen
No. 1, 1¼	2	3½	\$1 50
" 2, 1¼	2	4⅝	1 75
" 3, 1½	3	5½	3 00
" 4, 1½	5⅝	6	6 00

**Style F. Large Rectangular Shape Jars, Outside Measure.**

	Inches wide.	Inches long.	Inches high.	Per Doz.
No. 1,	4⅝	7⅝	8¼	\$ 9 00
" 2,	6	9¼	8	12 00

In ordering please name style of Jar by letter and size, and mention number of this page.

Hard Rubber Battery Jars to order, all sizes.



BATTERY MATERIAL—Continued.

CARBON BATTERY PLATES.

FOR BUNSEN, GRENET, SMEE, AND OTHER BATTERIES.

Long.	Wide.	Thick.	Cts. each.	Long.	Wide.	Thick.	Cts. each.
3	2	$\frac{1}{4}$	.05	9 or 10	6	$\frac{1}{2}$	.60
$3\frac{1}{4}$	$2\frac{1}{2}$	$\frac{1}{4}$	.06	10	6	$\frac{1}{4}$	.40
$4\frac{3}{4}$	$1\frac{3}{8}$	$\frac{1}{4}$	.06	11	6	$\frac{1}{4}$	.50
$4\frac{1}{2}$	$2\frac{3}{4}$	$\frac{1}{4}$	.09	11	6	$\frac{3}{8}$	.60
$5\frac{3}{4}$	$1\frac{5}{8}$	$\frac{5}{16}$	.08	11	6	$\frac{1}{2}$	.70
6	$\frac{7}{8}$	$\frac{5}{8}$	.08	11	9	$\frac{1}{4}$	.70
6	$1\frac{1}{2}$	$\frac{1}{4}$	.15	11	9	$\frac{3}{8}$	.80
6	3	$\frac{1}{2}$	.20	11	9	$\frac{1}{2}$	1.00
6	$1\frac{7}{8}$	$\frac{5}{8}$	.20	12	6	$\frac{1}{4}$	.60
7	4	$\frac{1}{4}$	.30	12	6	$\frac{3}{8}$	.70
7	$4\frac{1}{2}$	$\frac{1}{2}$	.40	12	6	$\frac{1}{2}$	.80
8	2	$\frac{1}{4}$	.20	12	12	$\frac{1}{4}$	1.10
8	2	$\frac{7}{8}$	.30	12	12	$\frac{3}{8}$	1.20
8	$5\frac{3}{4}$	$\frac{1}{8}$	.30	12	12	$\frac{1}{2}$	1.50
8	$5\frac{3}{4}$	$\frac{1}{4}$	.30	12	12	$\frac{5}{8}$	1.60
9	2	$\frac{1}{4}$	.20	12	12	$\frac{3}{4}$	1.70
9	6	$\frac{1}{4}$	.40	12	12	$\frac{7}{8}$	1.80
9 or 10	6	$\frac{3}{8}$	.50				

ZINC PLATES.

Rolled Plates, small, per lb.,	15 cents.
“ “ large, “	20 “
“ “ cut to order, per lb.,	20 “
Special prices for large quantities.	

Novelty Rods and Zincs for Novelty Disque, Leclanche, and other  
Open Circuit Batteries.

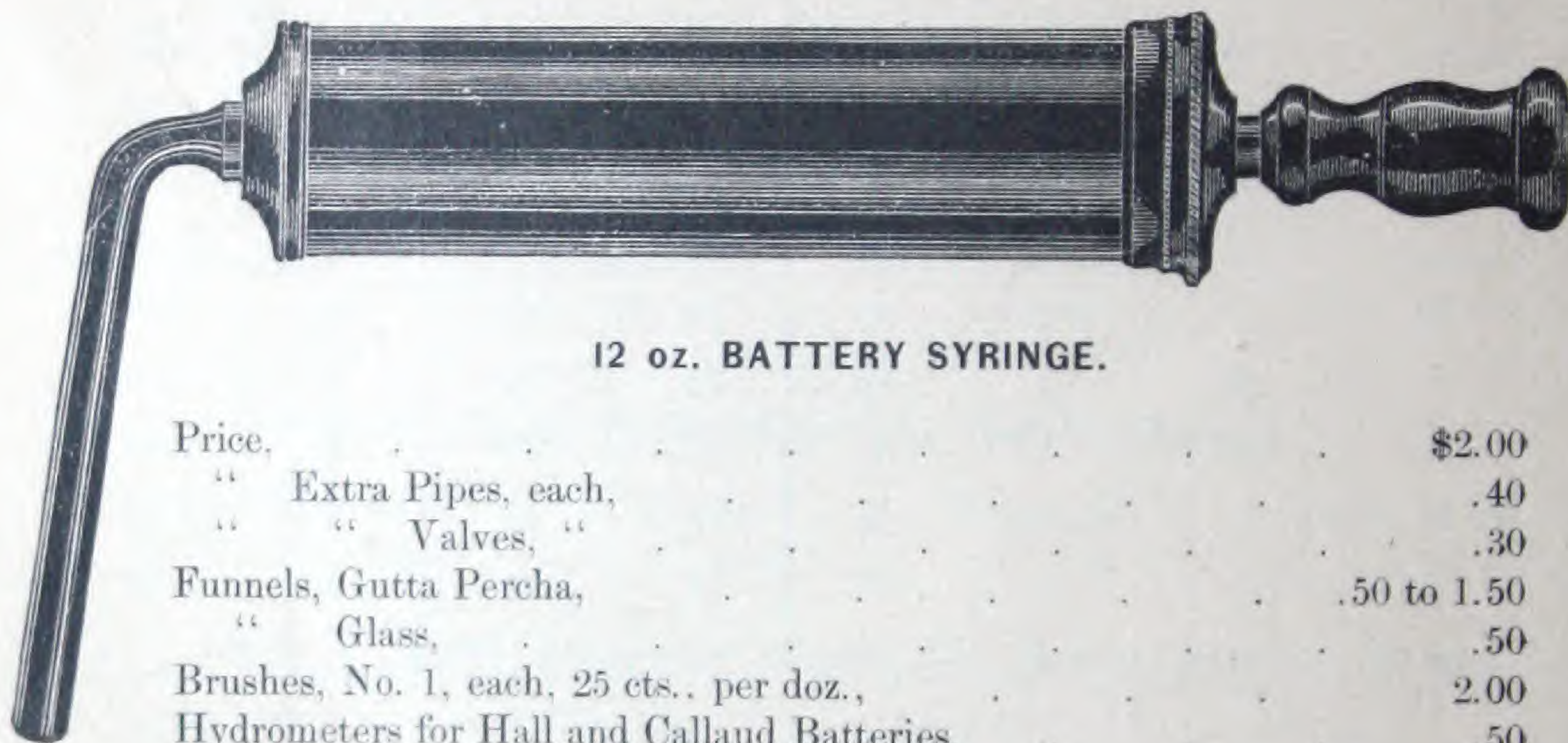
OUR OWN MAKE.

Price, each,	\$ .10
“ per 1000,	60.00

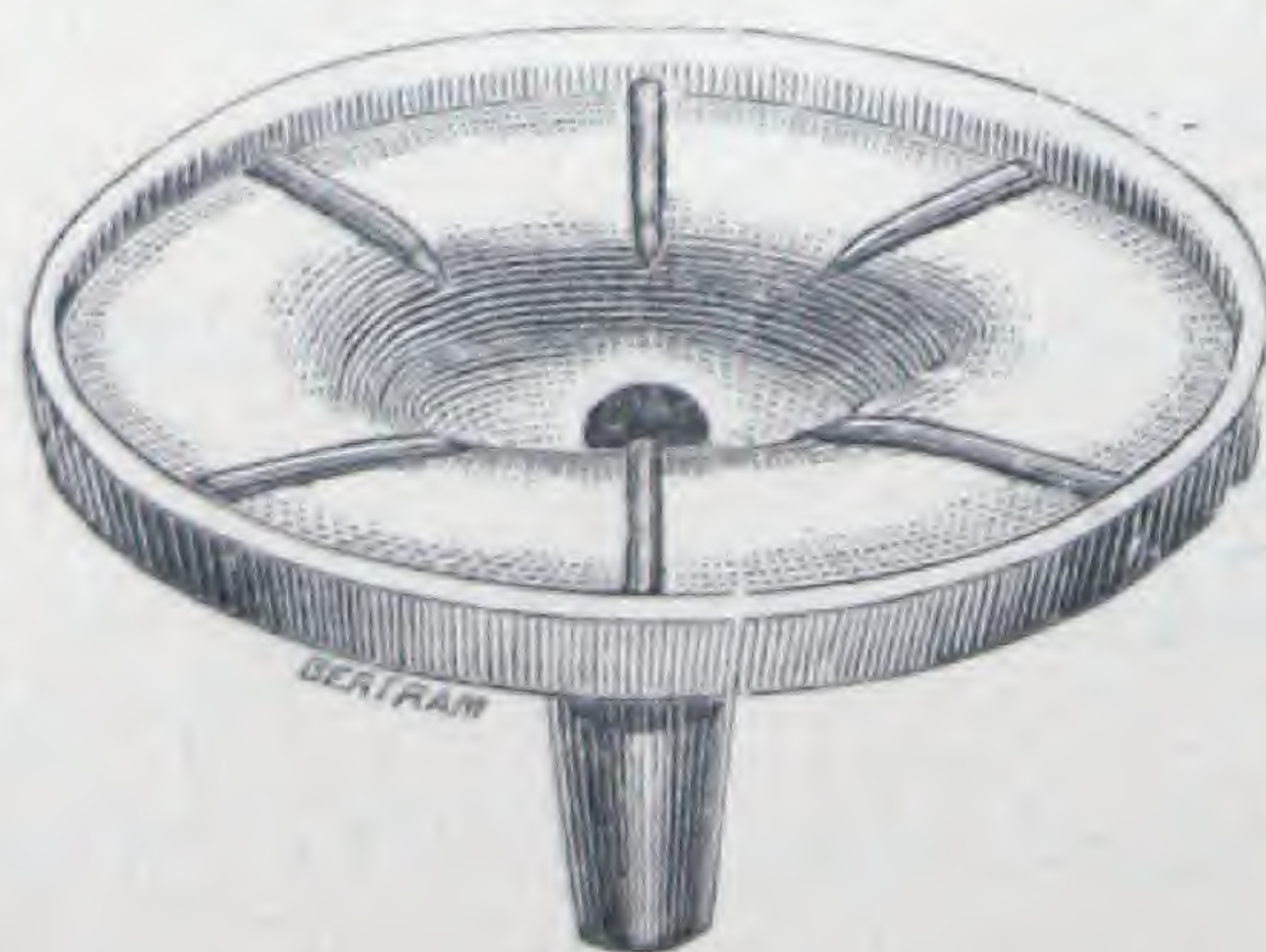


**BATTERY MATERIAL—Continued.****CHEMICALS.**

Acid—Nitric,	
“ Sulphuric,	
“ Hydrochloric,	
Bichromate Potash, per lb.,	\$ .25
Bisulphate of Mercury, per lb.,	1.50
Chloride of Ammonia, “	.20
Electropoion Fluid, “	.10
Blue Vitriol, “	.10
“ “ per barrel, lowest market price.	
Quicksilver, per lb.,	.80
Sulphate of Zinc, per lb.,	.10

**BATTERY UTENSILS.****12 oz. BATTERY SYRINGE.**

Price,	\$2.00
“ Extra Pipes, each,	.40
“ “ Valves, “	.30
Funnels, Gutta Percha,	.50 to 1.50
“ Glass,	.50
Brushes, No. 1, each, 25 cts., per doz.,	2.00
Hydrometers for Hall and Callaud Batteries,	.50

**PORCELAIN BATTERY INSULATORS.**

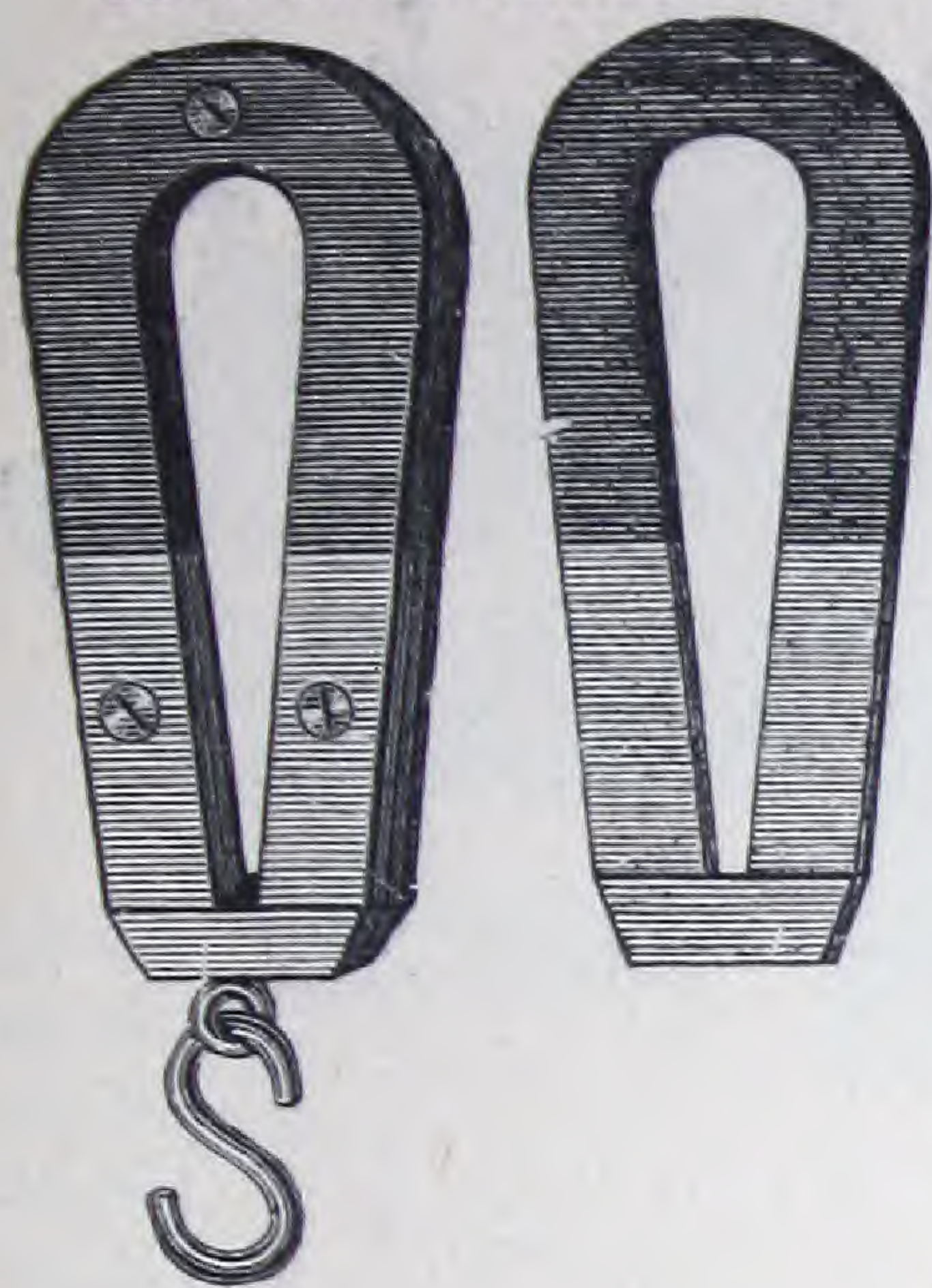
These Insulators are largely used by the Pennsylvania Railroad Co., Baltimore and Ohio Railroad Co., Western Union Telegraph Co., and others. By their use the battery shelves are kept clean, and present a much neater appearance.

Price, each,	\$ .40
“ per doz.,	4.00



## PERMANENT MAGNETS.

### COMPOUND HORSESHOE.



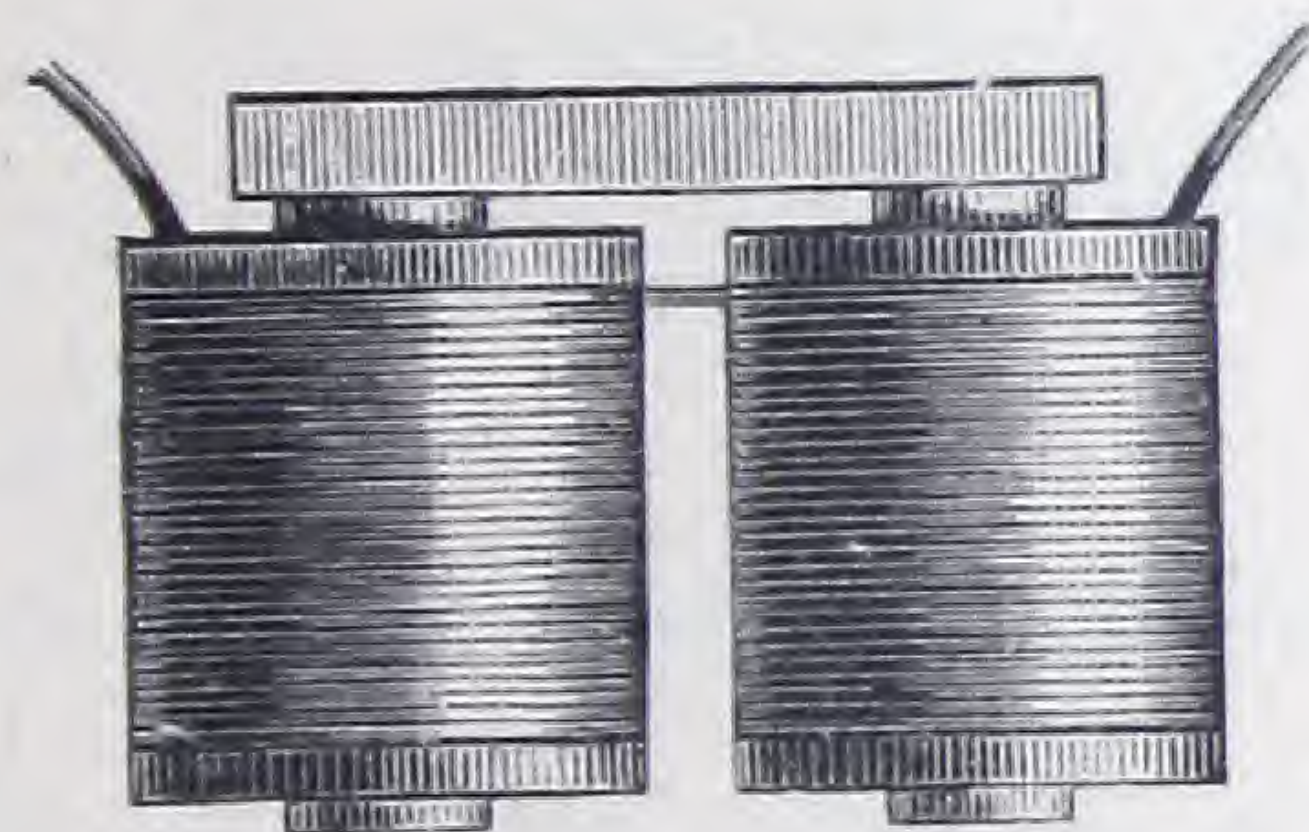
### PRICES.

2 inch,	\$ .10
2½ "	.10
3 "	.15
3½ "	.20
4 "	.25
5 "	.35
6 "	.60
7 "	.75
8 "	1.00
9 "	1.35
10 "	1.75
12 "	2.25
Compound, 4 bars—6 inches,	6.00
" 4 " 8 "	8.00
" 4 " 10 "	15.00

### MAGNETO MACHINE MAGNETS.

4 inch,	\$ .75
6 "	1.50
8 "	1.75
9 "	3.00
10 "	4.00

### ELECTRO MAGNETS.



#### Sounder and Pony Relay Sizes, Low Resistance.

Sounder, 5 to 50 ohms,	\$1.00 to \$2.50 per pair.
Relay sizes, 50 to 100 ohms,	3.50 "
" " 100 to 150 "	4.50 "
" " 150 to 400 "	5.00 "

### COMMON MAGNETS for BELLS, SMALL APPARATUS, Etc.

5 ohms resistance,	\$ .35
20 " "	1.00

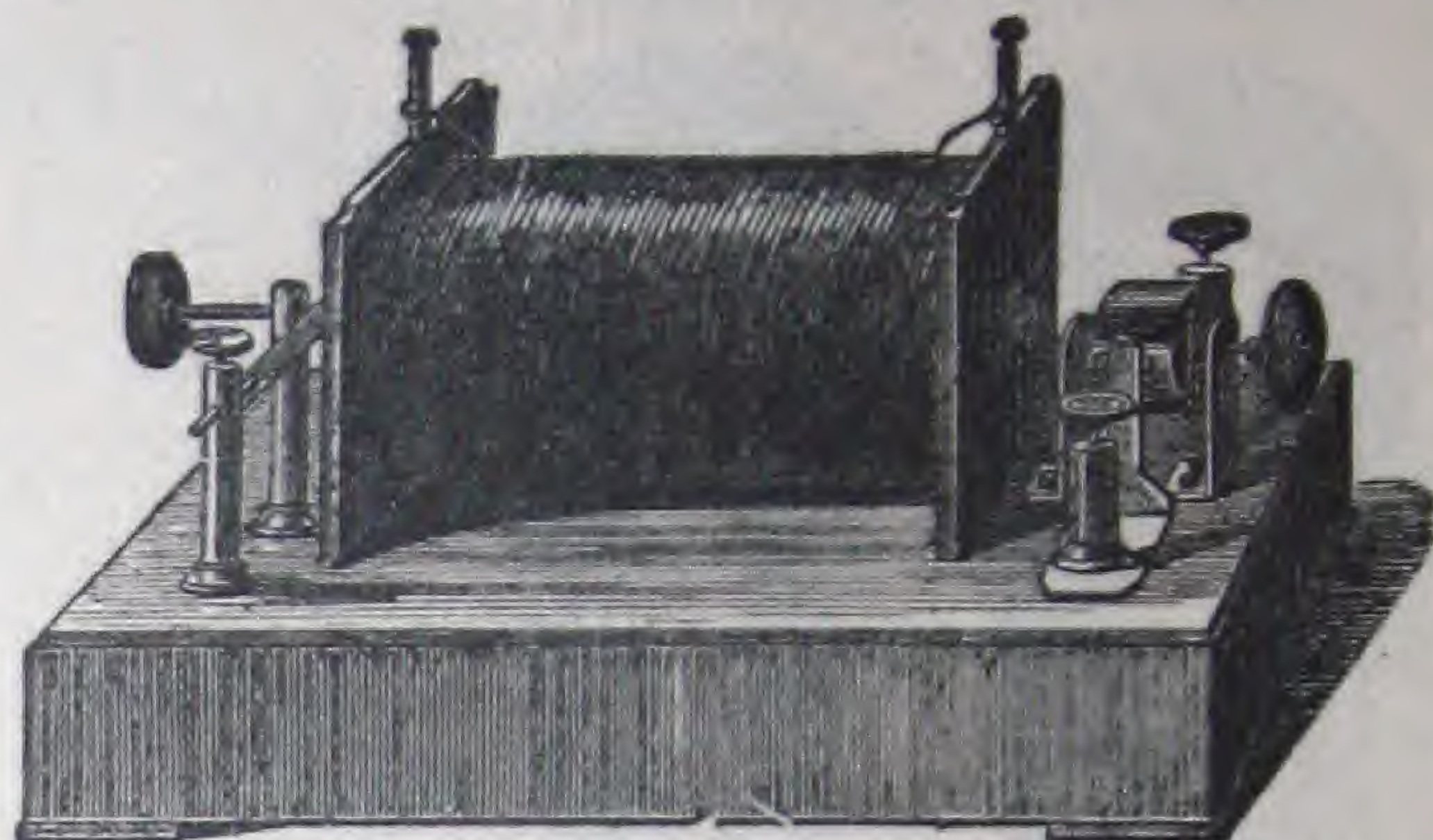
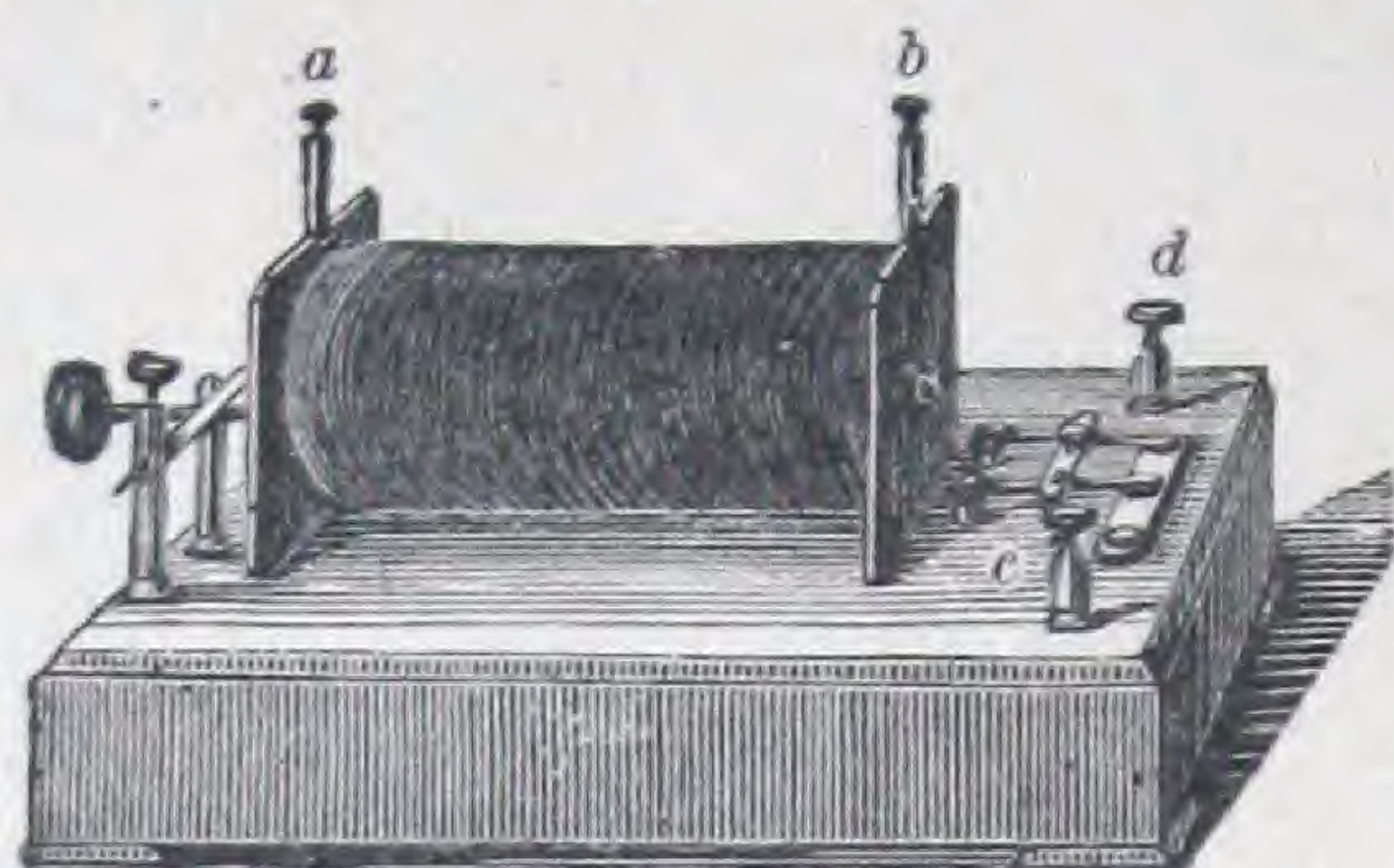
### BAR MAGNETS.

Cast Steel Bar, ¼x ⅝x 4 in., per pair,	\$ .30
" " " ¼x ¾x 6 "	.50
" " " ¼x1 x 8 "	1.00
" " " ¼x1¼x10 "	1.50

We make special magnets of every size and description to order.



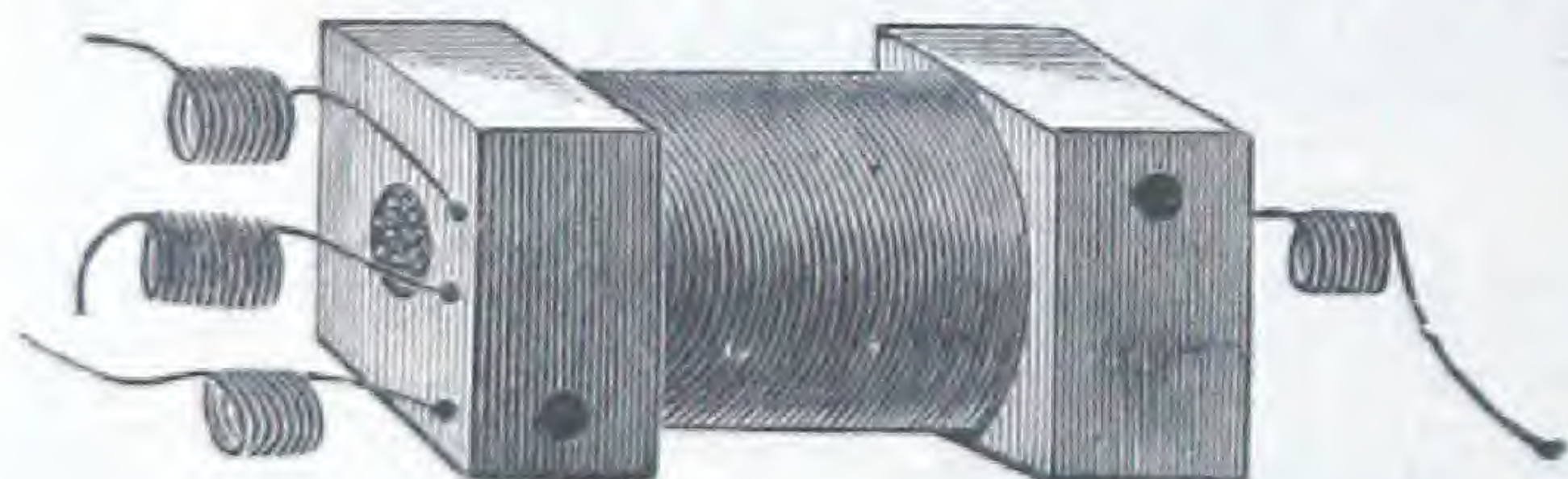
## INDUCTION COILS.



$\frac{1}{8}$ inch spark,	\$4.00	$1\frac{1}{4}$ inch spark,	\$35.00
$\frac{1}{4}$ " "	8.00	$1\frac{1}{2}$ " "	40.00
$\frac{1}{2}$ " "	12.00	2 " "	60.00
$\frac{5}{8}$ " "	18.00	3 " "	100.00
$\frac{3}{4}$ " "	25.00	4 " "	125.00

Coils with Sparks, 5 to 18 inches, to order.

### EXPERIMENTAL INDUCTION COIL



FOR  
TELEPHONE PURPOSES.

Price, \$1.50.

### MEDICAL INDUCTION COIL.

WITHOUT BATTERY.

A handsome and powerful medical coil, with cords and handles. These coils are best operated with Novelty A. battery.

Price, each, \$4.00.

### ELECTRO-MEDICAL HAIR BRUSH.

Used in the same way as an ordinary hair brush, furnishing the only suitable means by which currents of electricity can be properly applied to the head, at the roots of the hair.

Can be used in connection with any medical battery.

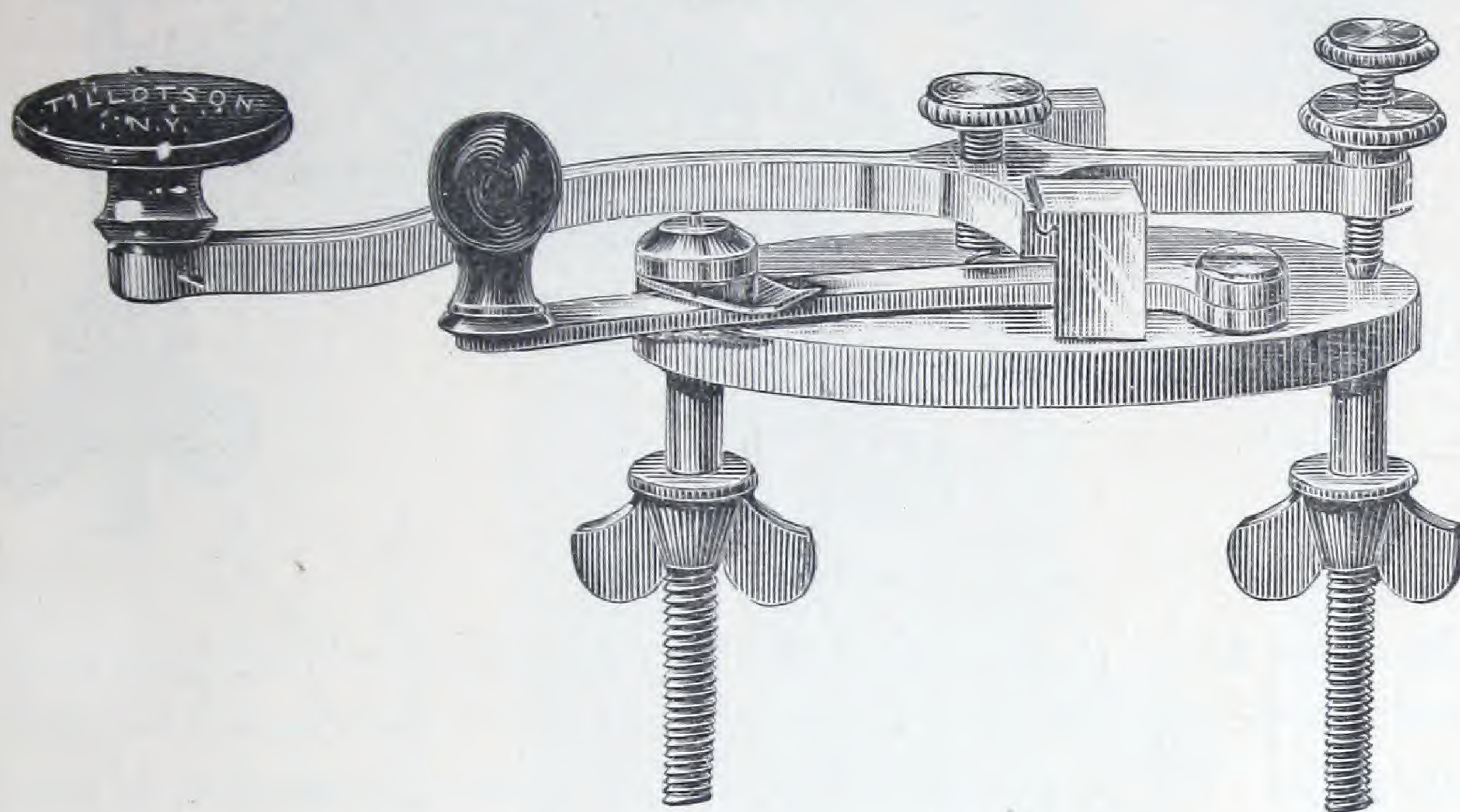
Price, each, \$2.00.



# TELEGRAPH KEYS.

## THE NEW STYLE VICTOR TELEGRAPH KEY.

(PATENTED.)



The Greatest Improvement In Telegraph Keys ever made.

The easiest working, most perfect contact, most perfect in construction, no side motion to lever, no trunnion connections. The neatest, handiest and best key manufactured.

The "VICTOR" key was used by the operator who won the first prize in the recent telegraphic contest in New York.

Price, each, . . . . . \$2.50.

We also furnish the above key without legs for use on desks, or wherever a legless key is preferable.

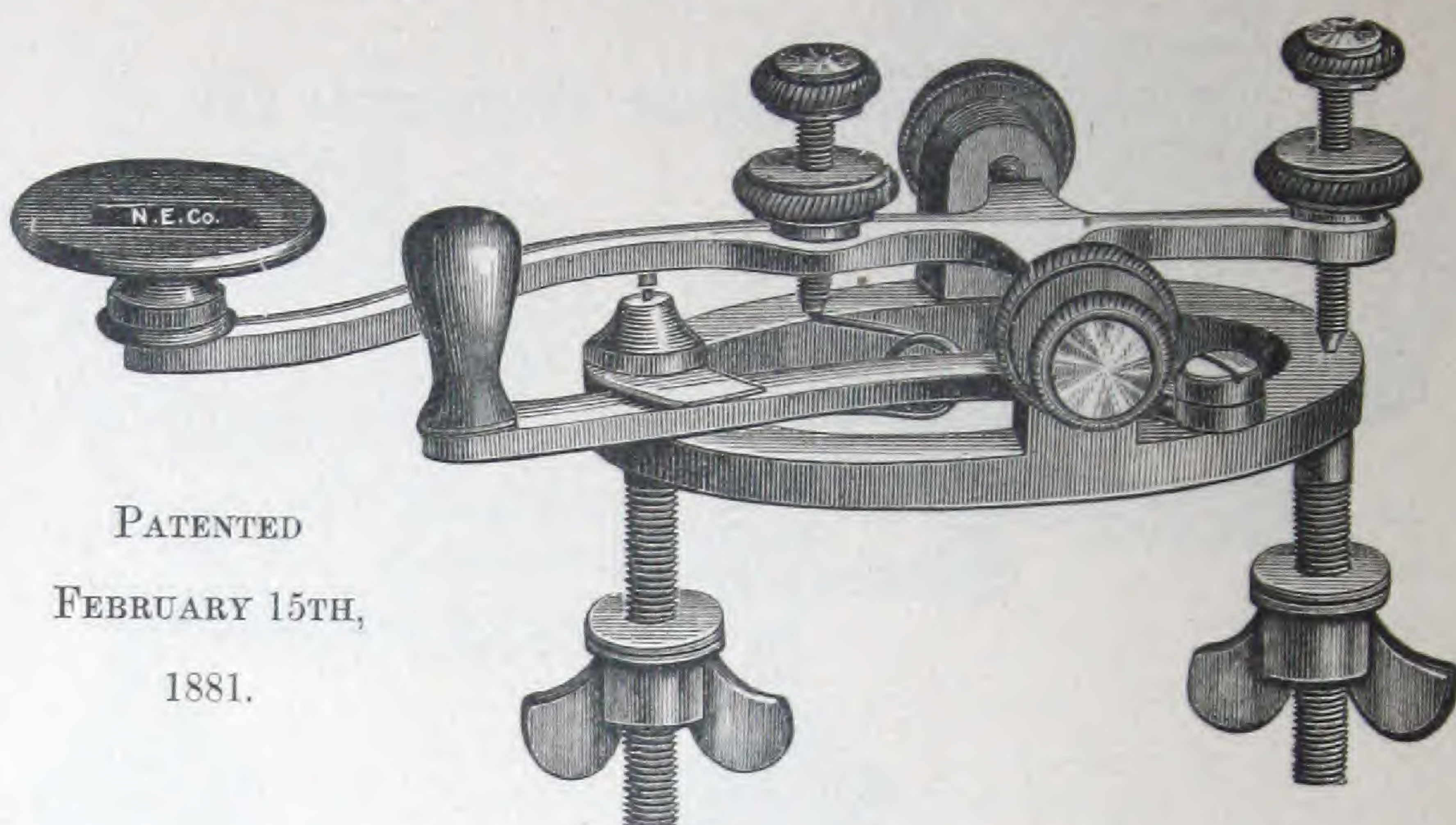
Price, each, . . . . . \$2.75.

Either key sent by mail to any part of the United States on receipt of price.



## TELEGRAPH KEYS.

### STEEL LEVER SOLID TRUNNION KEY.

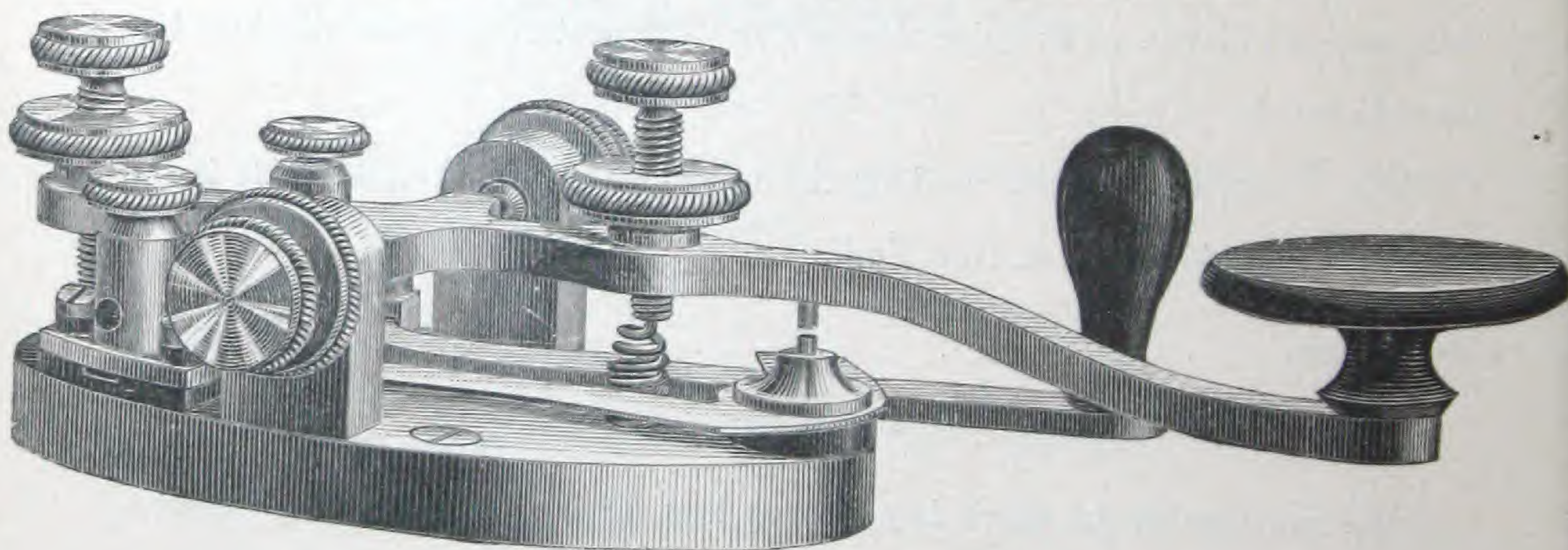


PATENTED  
FEBRUARY 15TH,  
1881.

The lever in the above is only half the weight of the ordinary brass lever as generally made. The size and proportions are such as to recommend it as a perfect operating key. The entire lever and trunnions together being made of but one piece of fine wrought steel, finely finished, and lever nickel-plated.

Price, each, . . . . . \$2.50.

### LEGLESS PATTERN STEEL LEVER KEY.



Suitable for use on desks, or wherever a legless key is preferable.

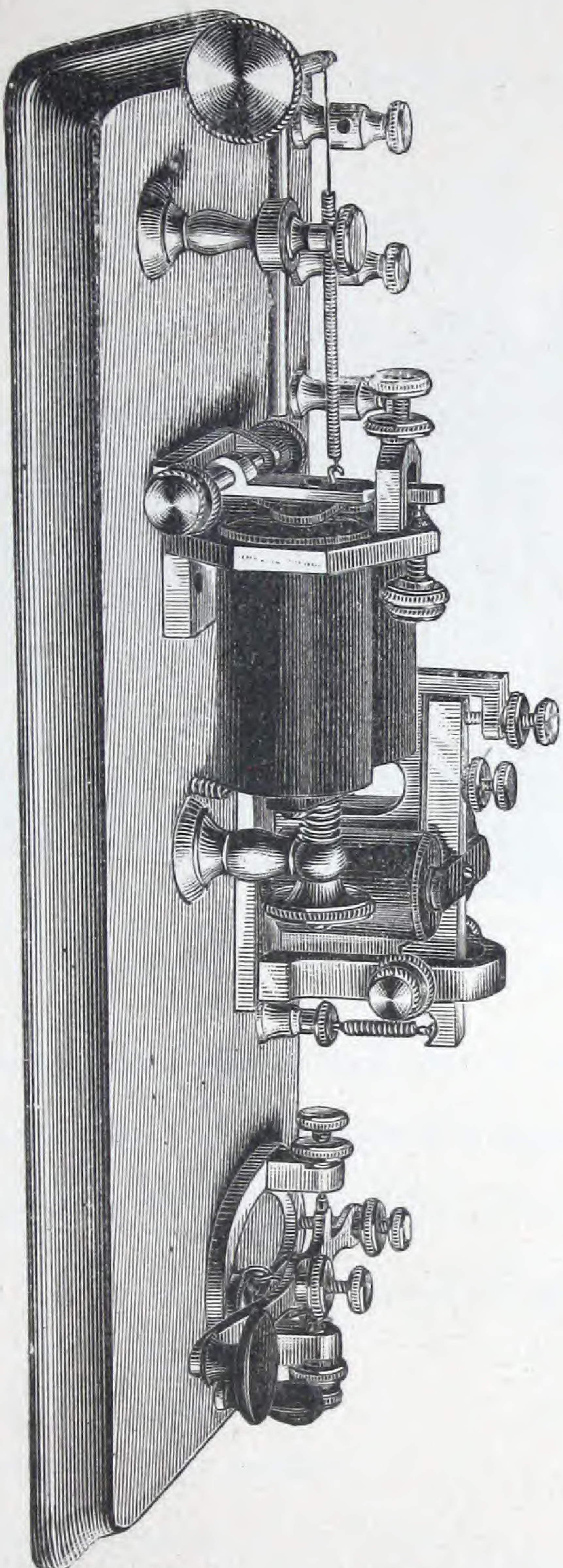
Price, each, . . . . . \$3.00.

Either key sent by mail to any part of the United States on receipt of price.



# TELEGRAPH INSTRUMENTS.

RELAY, STEEL LEVER KEY, AND GIANT SOUNDER.



## COMBINATION SET.

A complete set of instruments mounted on polished mahogany base, occupying a space 13 inches long, 6½ inches wide. For special office sets, and for use as testing sets at the switch-board in large offices.

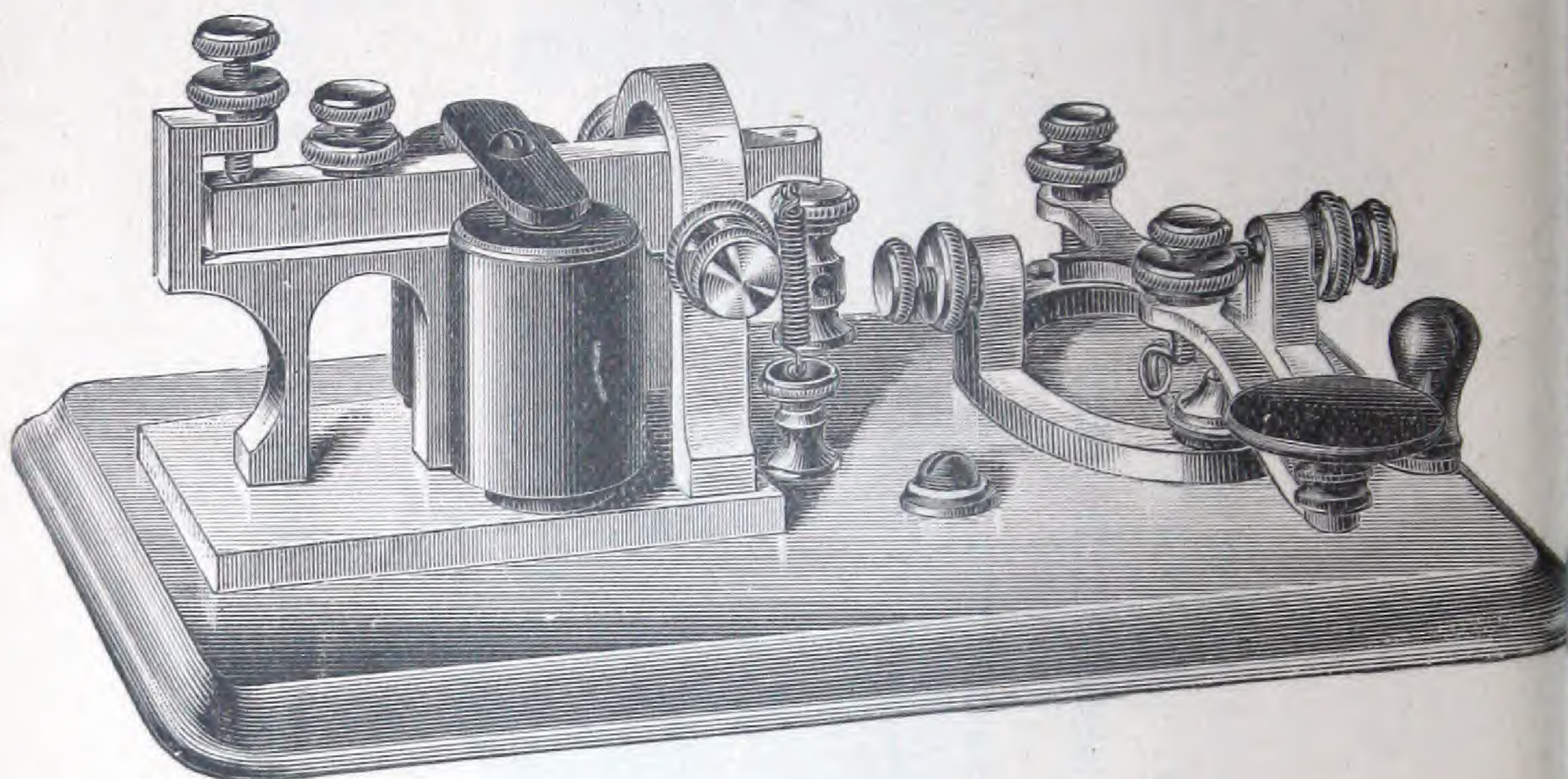
Resistance, 150 to 250 ohms. Price,

\$13.00



## Giant Sounder and Steel Lever Key.

For Private Lines, City Wires, and all Short Lines up to 10 or 15 Miles in Length.



The above set is very finely finished, with rubber-covered coils, fine silk-covered wire, wound to 20 ohms resistance, mounted on polished mahogany base, with a steel lever key, making it one of the handsomest and most perfect set of short line instruments upon the market.

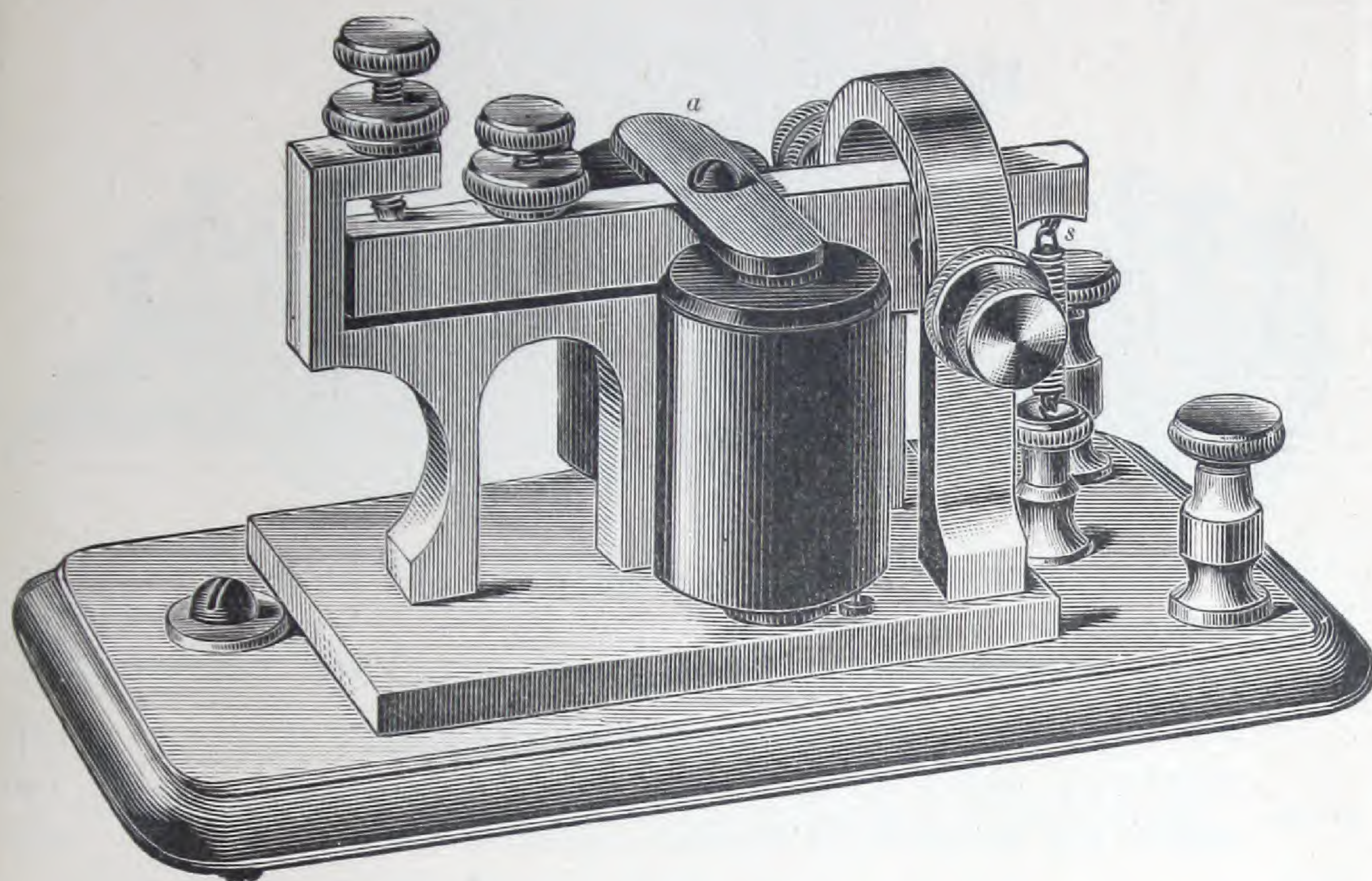
Price, . . . . . \$6.75

Same set, wound to 3 ohms resistance, with large Cell Battery, Book of Instructions, chemicals, wire, etc., a splendid learner's set, . . . . . \$7.00

Sent by mail, prepaid, to any part of the United States upon receipt of price.



## THE GIANT SOUNDER.



The above Sounder is now acknowledged as the best. It gives a clear, loud sound with just half the amount of local battery usually required with other makes.

Price, . . . . . \$3.50

Wound with fine wire to 20 ohms resistance for main line use (without relay), on lines up to 15 miles in length, . . . . . \$4.00

Giant Sounders of the same general appearance, but cheaper grade, for students, amateurs and short lines, with rubber-covered coils, . . . . . \$2.50

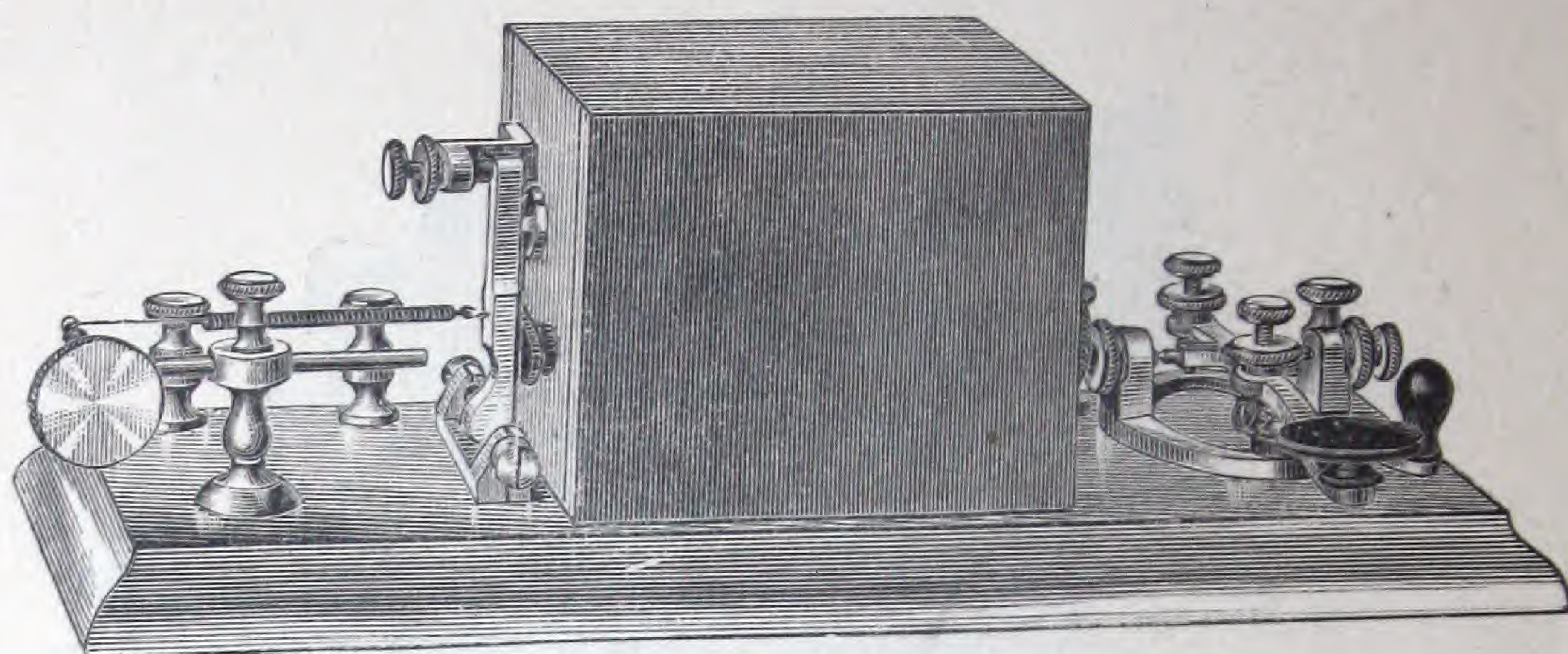
Metal Base Giant Sounders, . . . . . \$4.00

“ “ “ “ 20 ohms resistance, . . . . . \$4.50



## Box Sounding Relay and Steel Lever Key.

### COMBINATION SET.



Of best construction for loud, clear sound, without local sounder. Polished mahogany box and base.

Price, with steel lever key on base, 150 ohms,	\$10.00
“ with steel lever key on base, 160 to 300 ohms,	11.00
“ without key, and of 150 ohms resistance,	7.50
“ without key, and of 160 to 300 ohms resistance,	8.50

### FIRST-CLASS MAIN LINE RELAY.

150 ohms resistance, silk covered wire, polished rubber-covered coils, mahogany base mounted on ornamental surbase, extension adjustment.

Price each,	\$7.00
“ 160 to 200 ohms resistance,	7.50
“ 225 to 300 “ “	8.00

### POCKET RELAY.

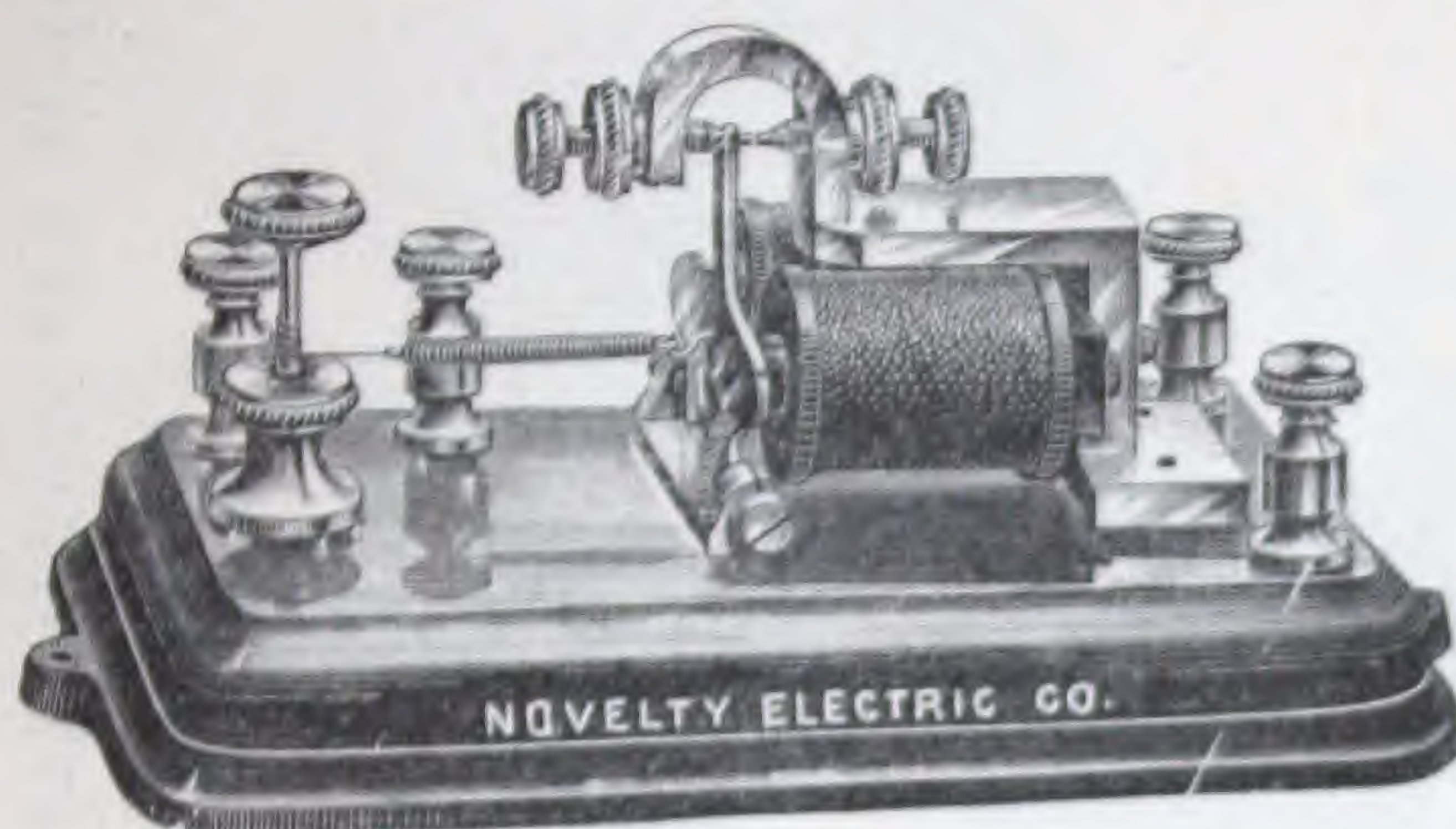
Has all the practical qualities of a full-sized sounding relay and key. Size of case outside,  $5\frac{3}{4} \times 2\frac{3}{4} \times 2\frac{1}{2}$  inches. For testing or for Military and Railway Telegraph purposes, it is the best.

Price, 150 to 250 ohms resistance,	\$16.00
------------------------------------	---------



# TELEGRAPH INSTRUMENTS.

## NEW FORM PONY RELAY.



Size of Base,  $6\frac{1}{2}$  Inches long and  $3\frac{1}{2}$  wide.

These are perfect instruments for working any line of less than 75 miles in length. Elegantly finished and mounted on polished mahogany base.

Wound to 20 or 30 ohms resistance for lines up to 15 miles in length, \$4.00

40 to 50 ohms, for lines 20 to 40 miles, 4.25

50 to 100 " " 40 to 75 " 4.75

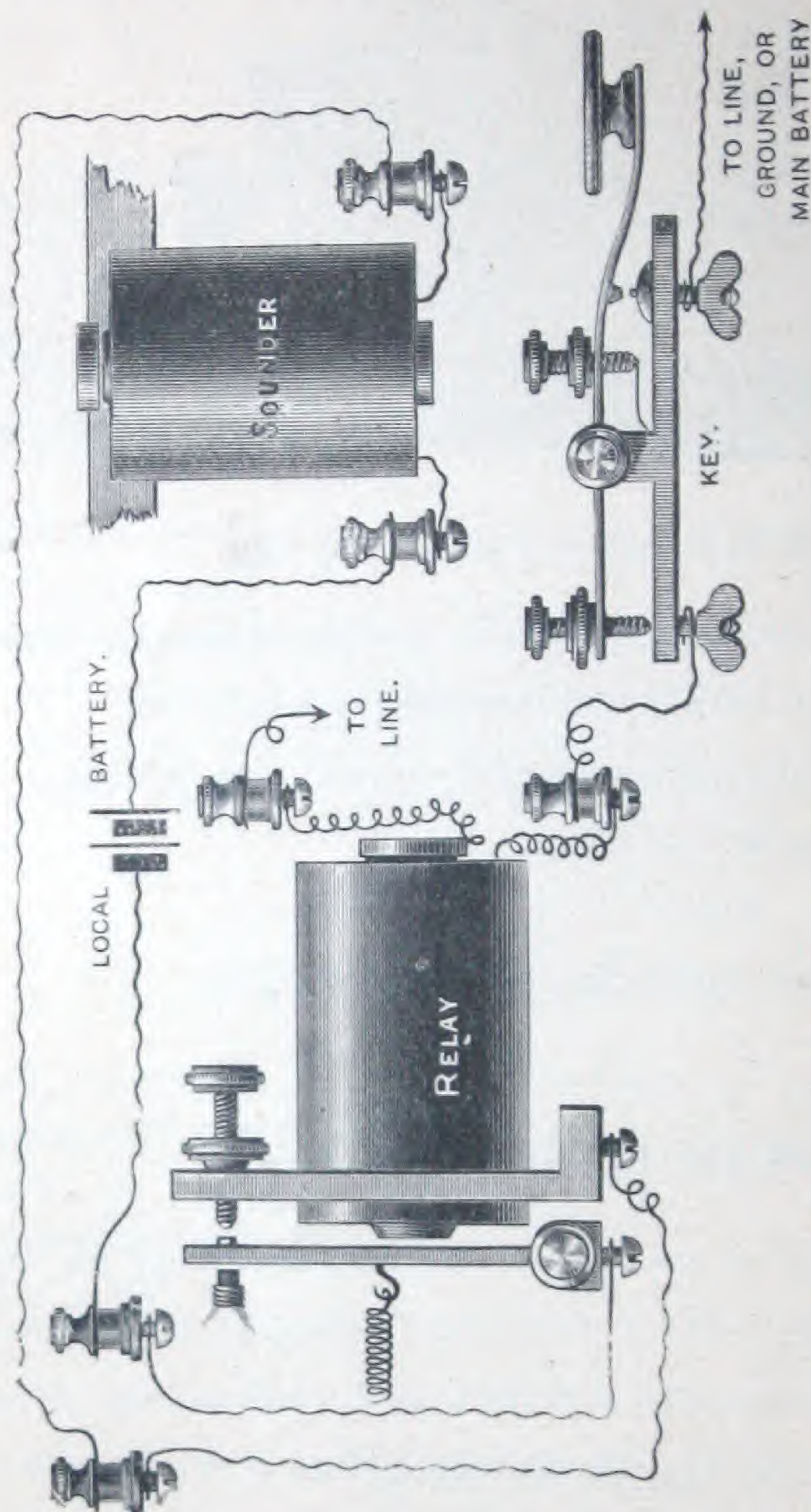
With Polished Rubber Covered Magnets, 50 cts. extra.

## DUPLEX TELEGRAPH SET.

These sets are arranged on two bases, one for the Transmitting side and one for the Receiving side; the wiring is all made and enclosed within the bases; the binding posts are numbered, so that to set them up it is only necessary to run the main, local and connecting wires to the numbered binding posts, according to the directions which accompany each set. These sets will work up to 250, 300, and, in some cases, 400 miles. To equip one wire for Duplex working requires two such sets.

Price, complete, for Two Sets, \$150.00



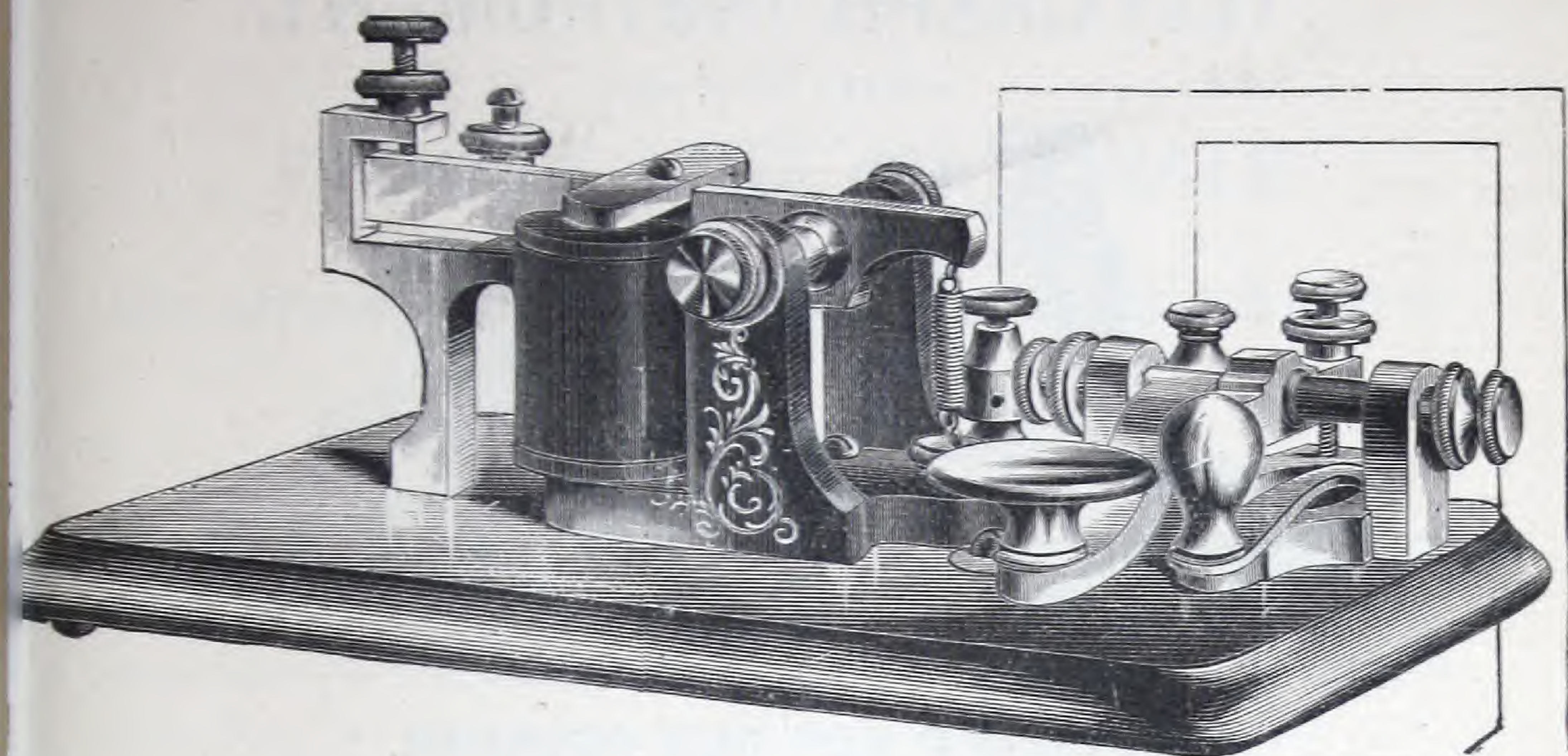


## DIAGRAM OF LOCAL OFFICE,

SHOWING WIRE CONNECTIONS OF SOUNDER, RELAY AND KEY WITH  
MAIN LINE.

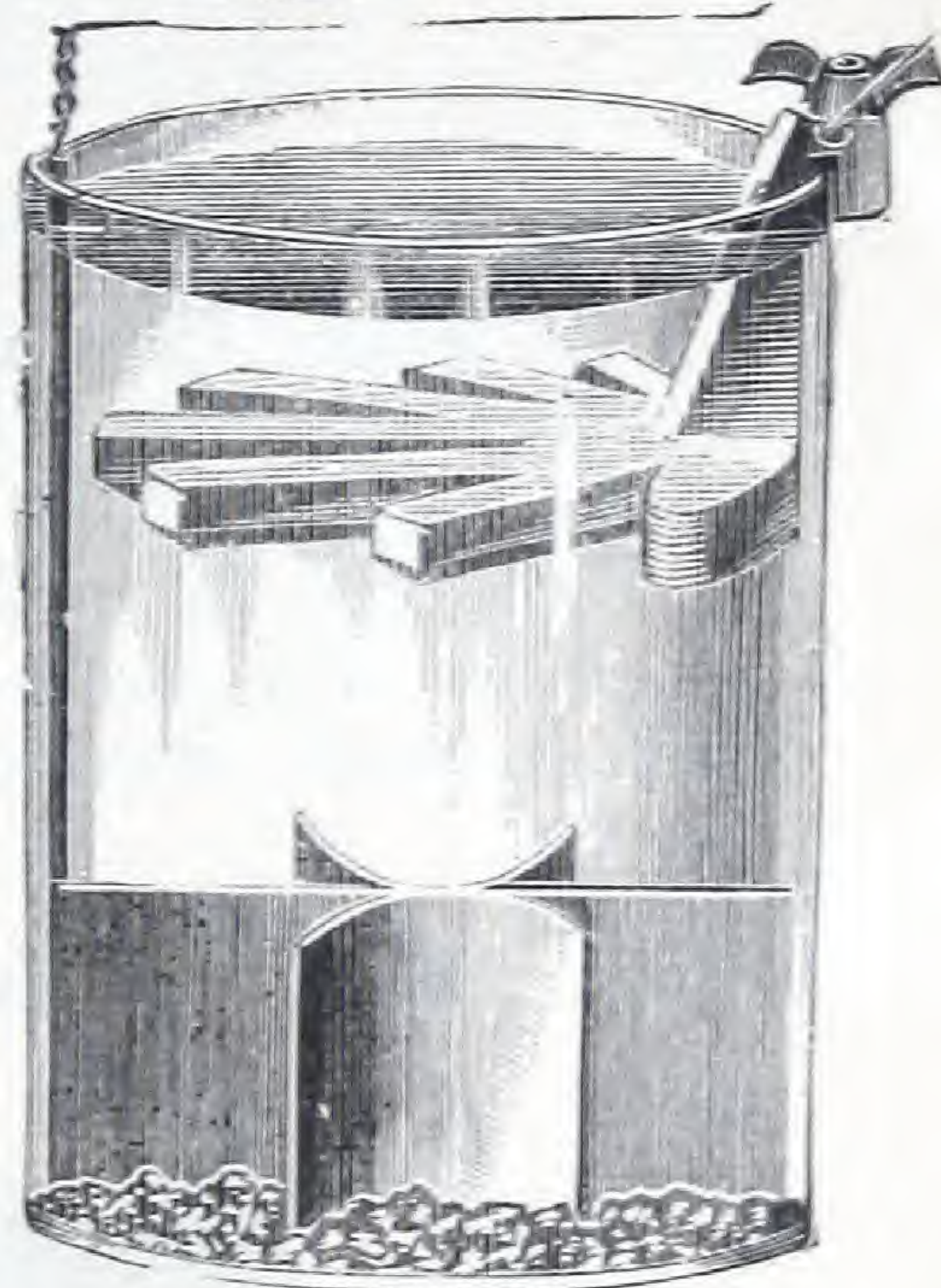


## MORSE LEARNERS' INSTRUMENT.



This is a full sized, well made, complete MORSE TELEGRAPH APPARATUS, of the latest and best form, including handsome GIANT SOUNDER and curved key, and a large cell of the best GRAVITY BATTERY.

It is especially adapted to the requirements of learners of telegraphy, schools, colleges, and the operation of *all short* telegraph lines.



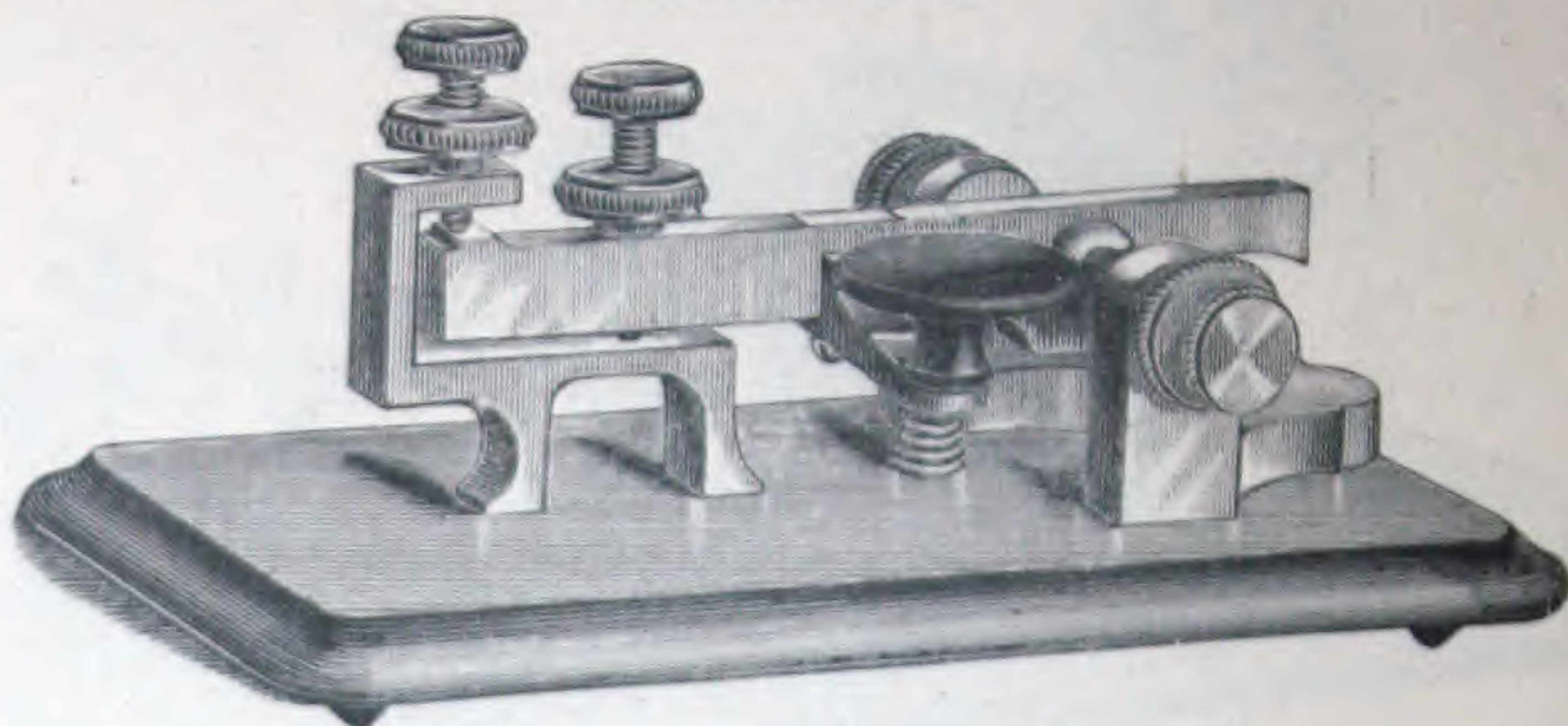
### PRICES.

MORSE OUTFIT COMPLETE, with battery, book of instructions, wire, chemicals, and all necessary material for operating.	\$3.75
MORSE INSTRUMENT, without battery,	3.00
Cell of Battery, complete,	.65
Morse Instrument, wound with fine wire, 20 ohms resistance, for use on out-door lines of from 200 feet to 10 or 15 miles in length, without battery, etc.,	3.75



## NEW MECHANICAL TELEGRAPH INSTRUMENT.

(Patented April 4, 1882.)



### COMBINED KEY AND SOUNDER.

NO BATTERY REQUIRED.

Works perfectly as a **KEY**, with sound equal to the best **SOUNDER**.

For **MORSE ALPHABET PRACTICE** in sending and reading by sound, and for **TEACHING THE MORSE ALPHABET**. Can be carried in the pocket or satchel, and is always ready for use.

Price, with Telegraph Instruction Book, package of Morse Alphabet Cards, etc., \$1.50. Sent anywhere in the United States, by Mail, prepaid, on receipt of price, in stamps, money order, or registered letter.

### THE "SNAPPER" SOUNDER, PERFECTED.



No. 1.



No. 3.

The best and cheapest Mechanical Telegraph Instrument for Morse Alphabet practice in sending and reading by sound, and for the use of Students of Telegraphy, is the **SNAPPER SOUNDER, PERFECTED**. These popular little instruments, patented March 2, 1875, have lately been much improved, and are now the most convenient of all Mechanical Sounders. They can be carried in the vest pocket, and are always ready when wanted, thus giving opportunity for frequent practice. We furnish them in three styles:

- |   |        |
|---|--------|
| No. 1. Plain Frame and Blued Steel Springs, with Brass Knob,              | \$ .25 |
| No. 2. Nickel-plated Frame and Blued Steel Springs,                       | .50    |
| No. 3. Nickel-plated Frame and Blued Steel Springs, with Rubber Key Knob, | .75    |

Sent postpaid, with Instruction Book, to any address upon receipt of price.



## LIST AND PRICES

OF

## PRIVATE LINE MATERIALS

AND APPLIANCES USUALLY REQUIRED IN CONNECTION WITH  
AMATEUR TELEGRAPHS.

Line Wire, No. 12, Galvanized, per mile,	\$12.00
“ “ “ “ per 100 feet,	50
Glass Insulators, with wooden bracket and spikes complete, each,	8
Office Wire, No. 18, Insulated, for all indoor use and in connecting the outdoor line with instruments, batteries, &c., per lb. (150 feet.)	50
Per foot,	$\frac{1}{2}$
Round Top Steel Staples for fastening indoor wires to wood-work, etc., per gross,	12
Gravity Batteries, per cell,	65
Extra Zincs, each,	25
Extra Coppers, each,	15
Extra Jars, each,	25
Blue Vitriol, per lb.,	10
Sulphate of Zinc, per lb.,	10
Wire Connectors, each,	8
Wire Cutting Pliers, Line Wire Size, each,	2.25
Small Size, for office use,	1.00

Equipment for Ordinary Practice at  
Learning Telegraphy.

One Regular "Morse Outfit,"	\$3.75
-----------------------------	--------



## Private Line Materials and Appliances.

Equipment and Cost of a Local Practicing or Communicating Line,  
Indoors, where two Instruments are within 100 feet  
of each other.

2 Regular Morse Outfits,	\$7.50
1½ lbs. Office Wire (extra) 225 feet,	.75
1 Box Steel Staples,	.12
1 Extra Cell of Battery	.65
5 lbs. Blue Vitriol	.50
	<hr/>
	\$9.52

If the indoor line is less than 100 feet in length, the extra cell of battery will not be required, as the two cells which are sent with the outfits will be sufficient. The extra amount of office wire needed will also depend upon the length of the line. For each additional 150 feet of indoor line add one more cell of battery.

Equipment and Cost of an Outdoor Line of from 200 to 800 feet  
in Length, with two Instruments connected.

Two 20 ohm Morse Instruments,	\$7.50
4 to 10 cells of battery, each,	.65
10 lbs. Blue Vitriol,	1.00
2 " Sulphate of Zinc,	.20
6 to 10 Pony Insulators and Brackets, each,	.08
1 lb. Office Wire,	.50
1 Box Steel Staples,	.12
200 to 800 ft. No. 12 Galvanized Telegraph Wire, per 100 feet,	.50

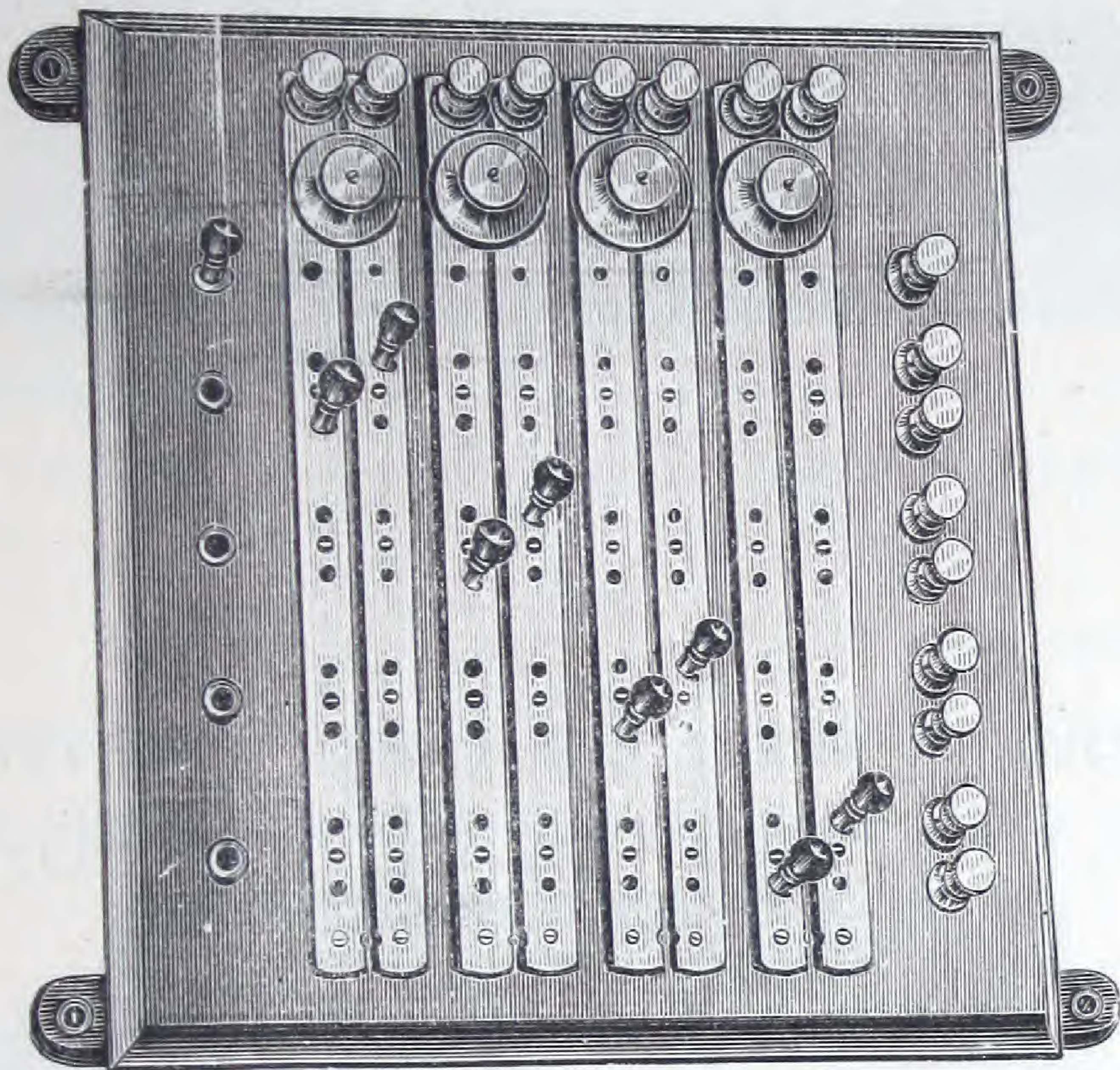
If more Instruments are to be connected to the line, add one more cell of battery for each 20 ohm instrument so connected, and one cell for each additional quarter mile added to length of line.



SWITCHES.

Western Union Pattern or "Button" Switches, with Disc Lightning Arrester.

Four-Line Switch.



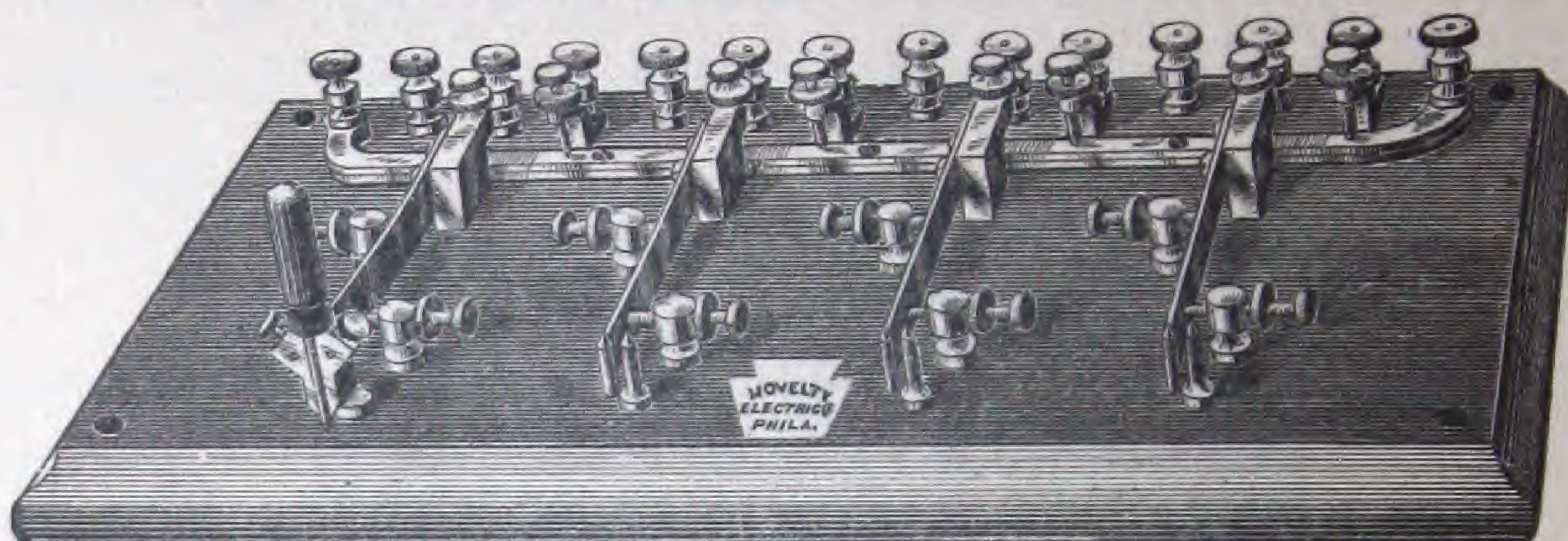
PRICES.

1 Line,	2 Perpendicular Bars,	\$ 3.00
2 "	4 " "	6.00
3 "	6 " "	10.00
4 "	8 " "	14.00
5 "	10 " "	18.00
6 "	12 " "	25.00
7 "	14 " "	30.00
8 "	16 " "	38.00
10 "	20 " "	55.00
12 "	24 " "	74.00



## The Novelty Improved Plug Cut-Out, GROUND SWITCH AND LIGHTNING ARRESTER.

ADOPTED BY THE PENNA. R. R. CO.

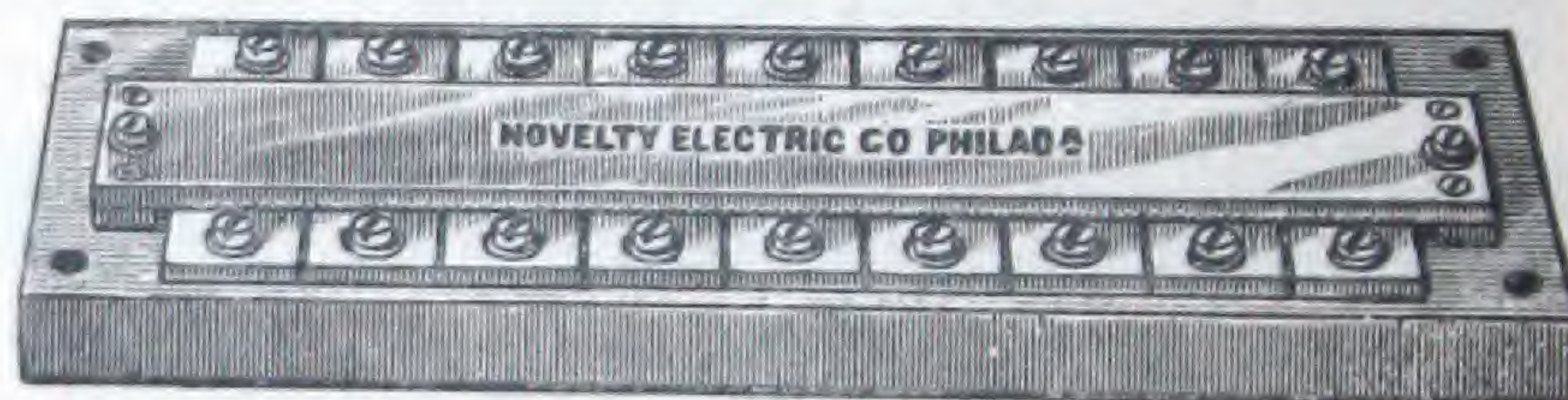


The above cut shows a four line board with a plug for looping in an instrument or telephone.

One line Cut-Out, with plug,	\$4.00
Two line " "	9.25
Three line " "	13.75
Four line " "	16.00
Cut-Out plugs, each,	1.00

### NOVELTY PLATE LIGHTNING ARRESTER.

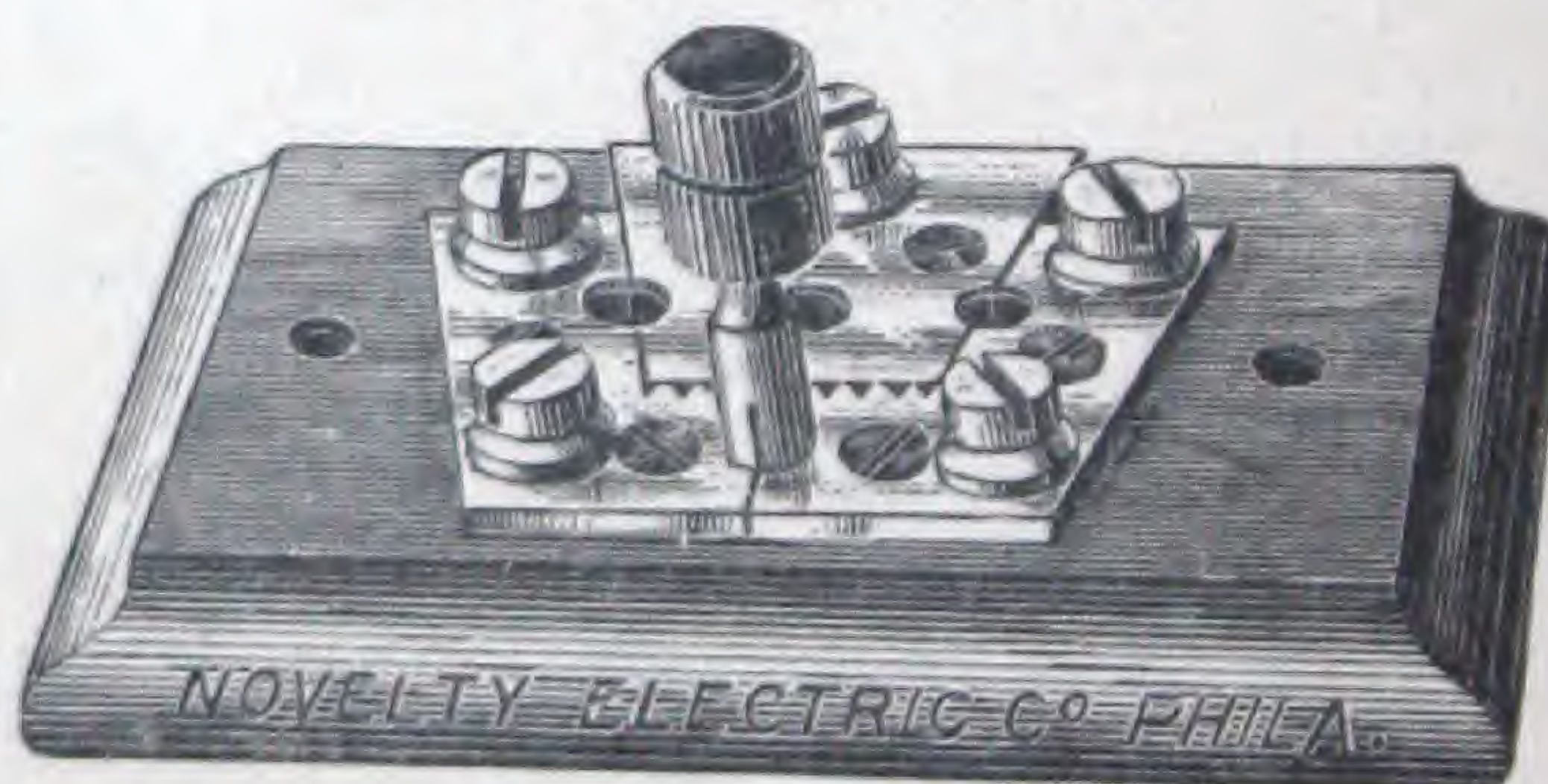
Very Heavy, with Ground Connection at each end.



Price per Line,

75 Cents.

### LIGHTNING ARRESTER, CUT-OUT AND GROUND WIRE SWITCH.

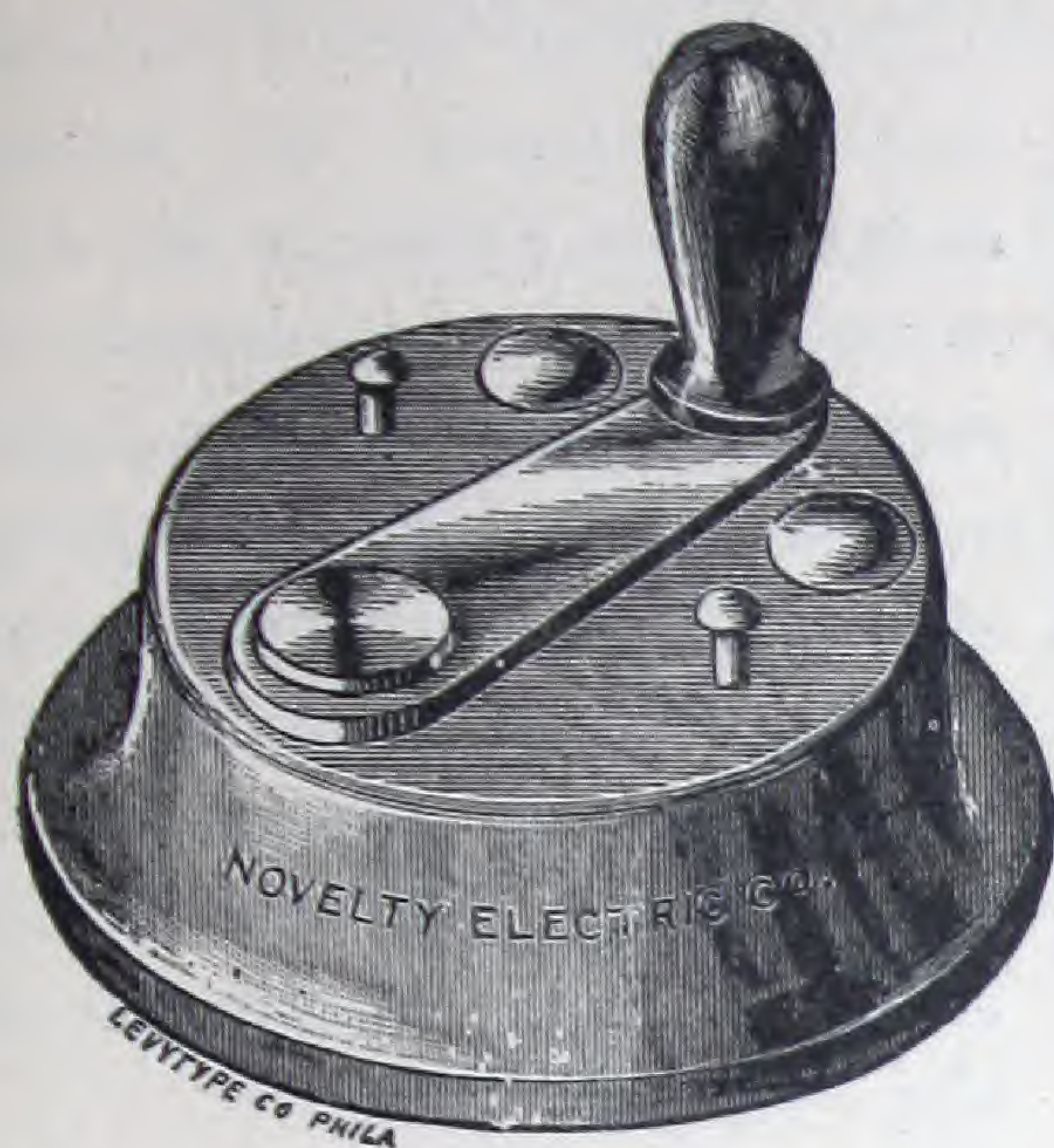


An Excellent and Cheap Article for Amateurs and all Short Lines.

Price, with Plug,	90 Cents.
Plugs, each,	25 Cents.



## HOLLOW WOOD BASE SWITCH.



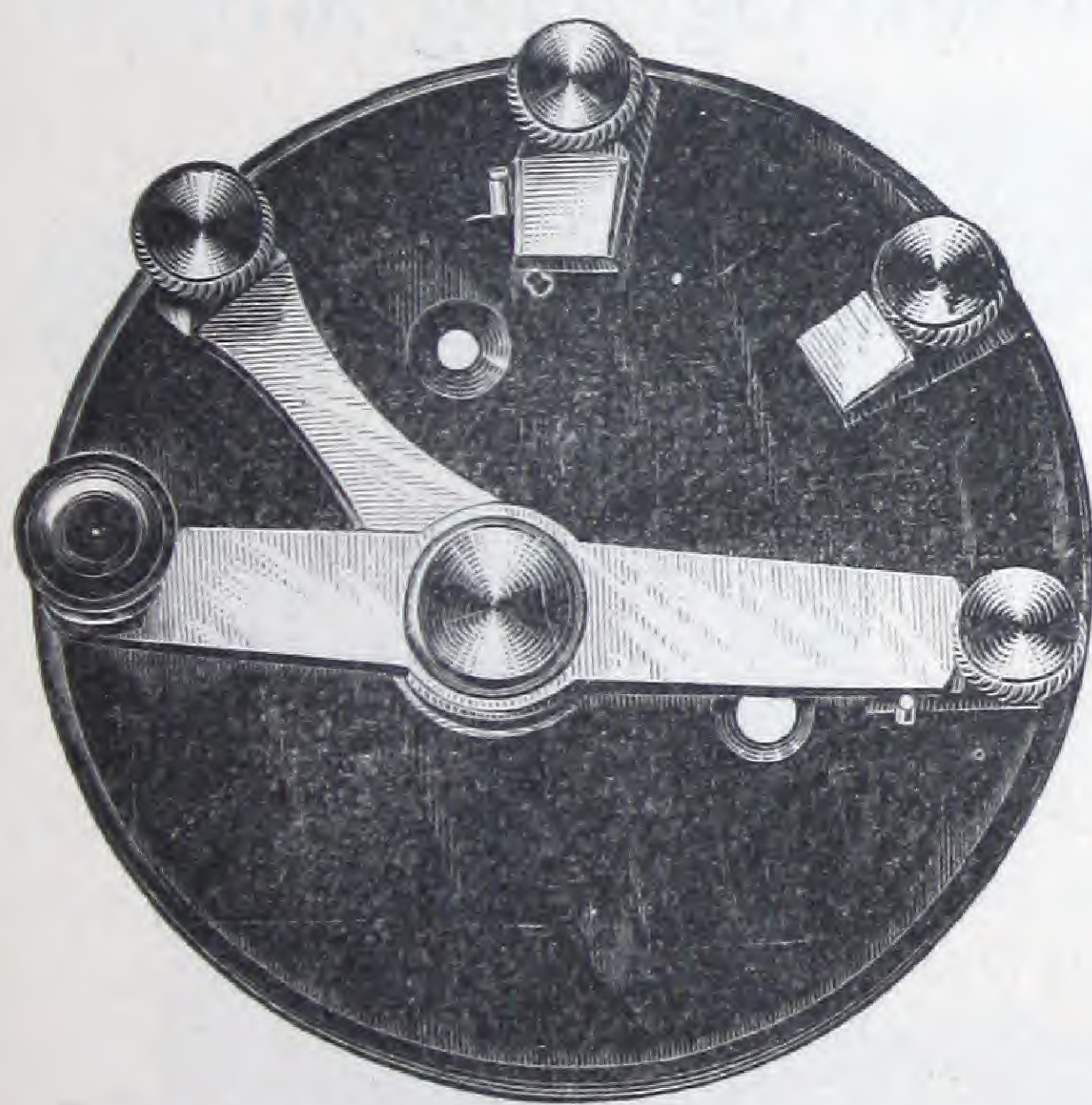
An improved desk or table switch, much more convenient than the old style. It has a hollow base, which permits of all wire connections being made to binding posts underneath; can be readily attached to desk or table without cutting or disfiguration. Has handsomely polished base, with hard rubber knob.

Price each, 1 connecting point,	50 Cents.
" " 2 " "	55 "
" " 3 " "	60 "
" " 4 " "	75 "

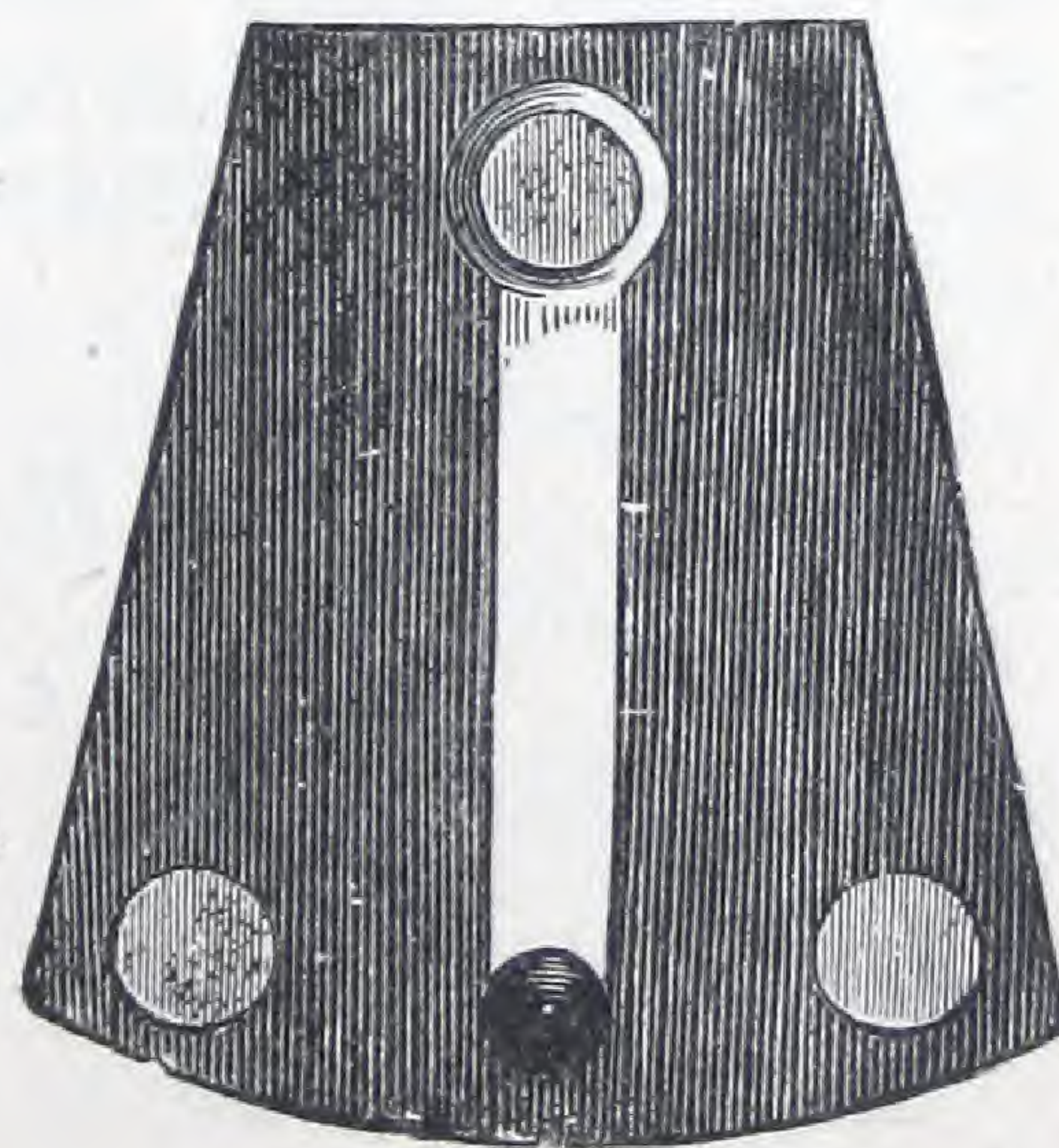
## RUBBER BASE SWITCHES.

Cut, Three Point Size.

With round hard rubber base for one, two, three or more points.



Price, each, 1 and 2 points,	\$ .90
" " 3 " 4 "	1.00

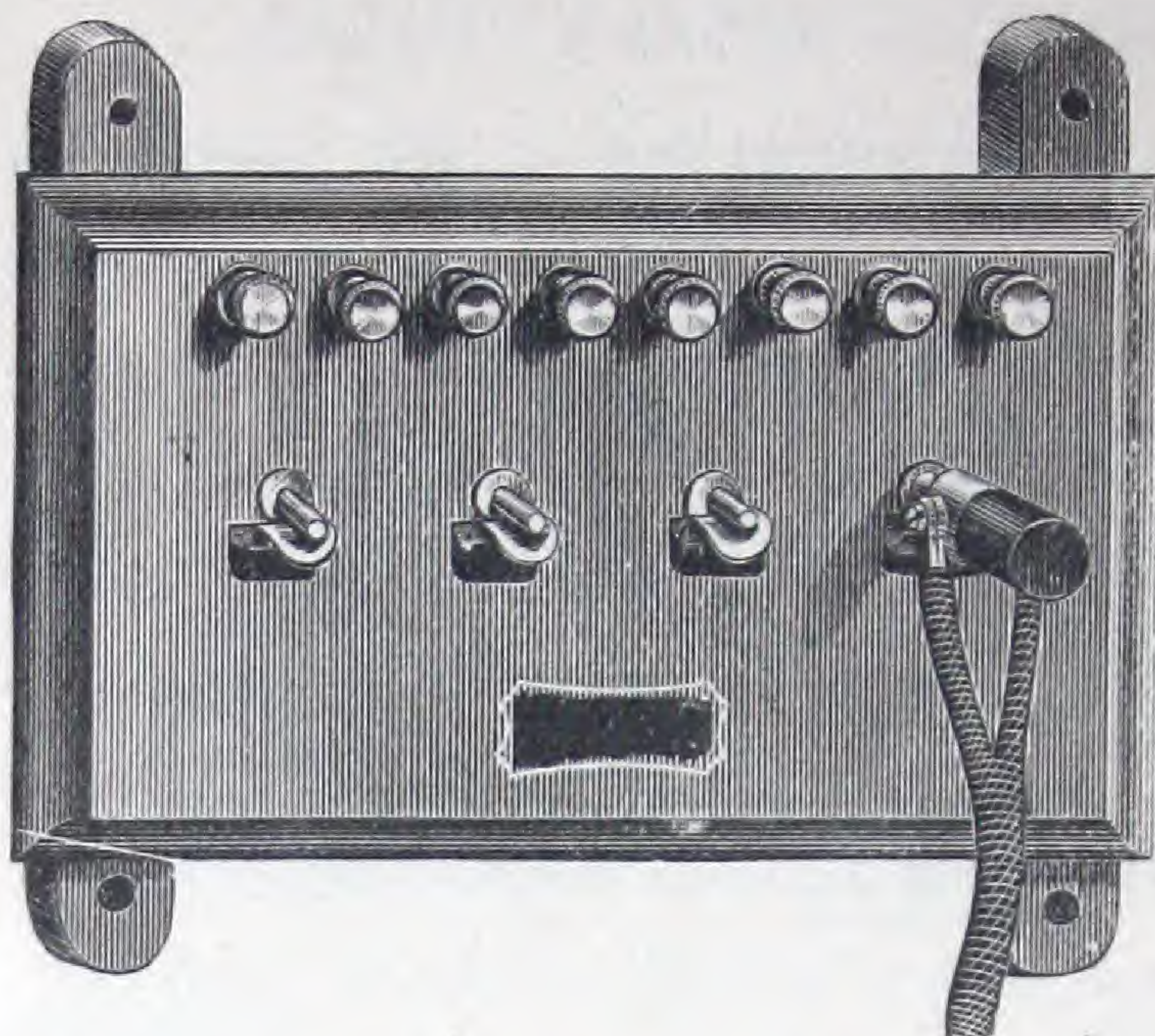


Single point switch, with hard rubber base, 75 cts.

2 and 3 point switch, " " " " 80 "



## FOUR WIRE SPRING CUT-OUT.



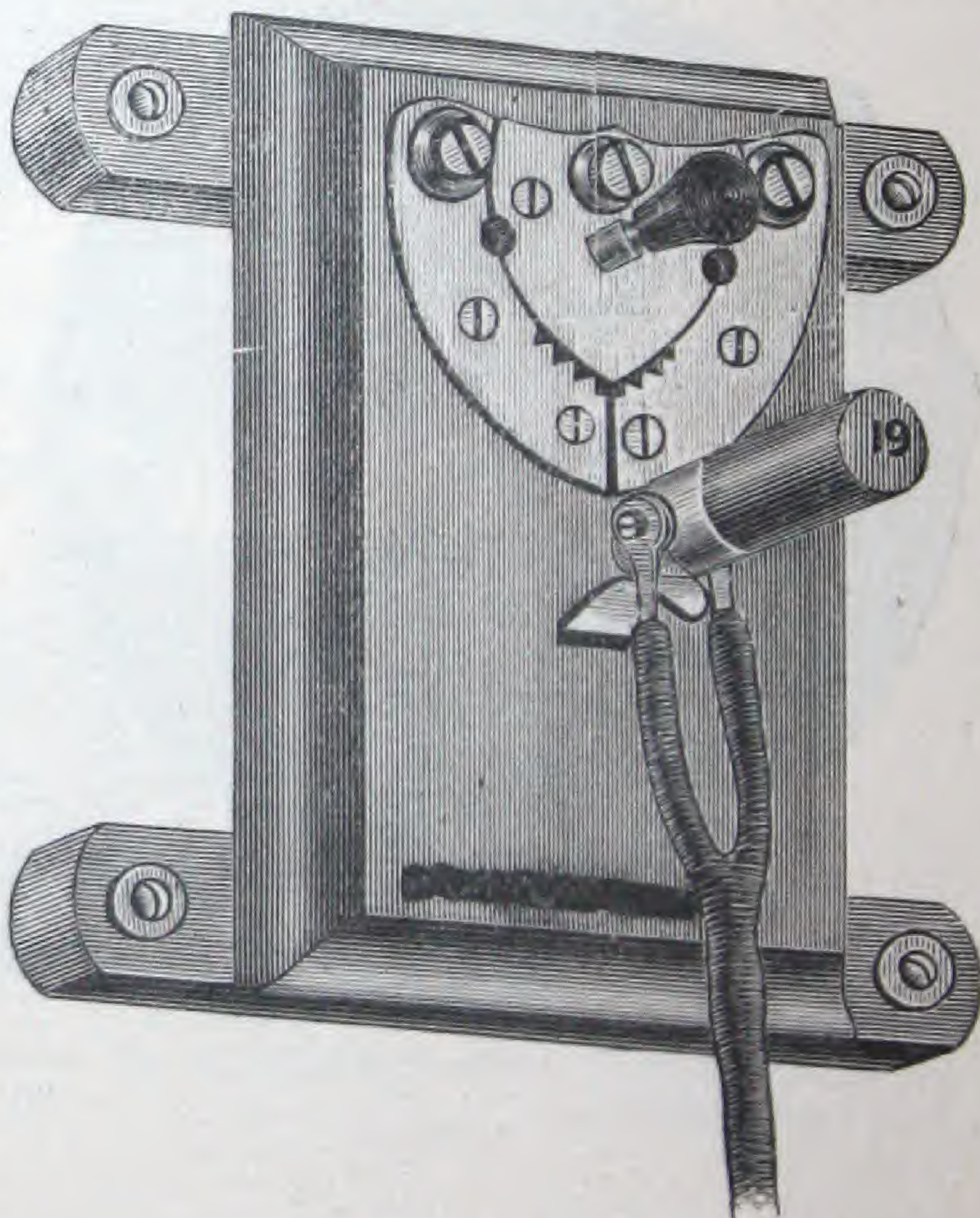
Patent spring cut-out without lightning arresters, for testing station, cable houses, or for any situation where it is desired to connect, by inserting plug, a single instrument to any one of a number of lines. This cut represents one for four lines. We make them of all sizes from one wire upwards. The insertion of plug puts instruments in circuit. Withdrawal of plug "cuts out" reliably.

Price, 1 Wire, without plug and cord,	\$1.25
" 2 " " " " "	2.25
" 3 " " " " "	3.00
Over three wires,	90cts. per line.
Plug and three feet silk double cord,	\$1.25

## Union Spring Cut-Out and Lightning Arrester.

This adaptation of our patent spring jack fills the place in telegraphic apparatus of the old form known as plug switch, and is the best spring cut-out for city "branch offices," or "way offices" where it is not required at any time to make cross connections of wires or other changes besides simply changing instruments from one line to another with plug and cord.

1 Line, without plug and cord,	\$2.00
2 Line, without plug and cord,	4.00
3 Line, without plug and cord,	6.00
Plugs with 3 feet cord attached,	each, \$1.25





## MEASUREMENT APPARATUS.

The increasing use of Measurement Apparatus, and its great value as applied to the numerous requirements of every-day work in the Telegraph Office, Workshop and the Laboratory, warrants us in believing that the following sets of instruments, with plain and easily understood instructions, will meet with popular favor.

The measurements most often required in connection with Telephone and Telegraph office work generally consist of resistances under 2,000 ohms, such as relays, electro magnets of various instruments, batteries, coils of wire, carbons, fluids, etc.

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### ELECTRICAL MEASUREMENTS

AND

### THE GALVANOMETER AND ITS USES.

BY T. D. LOCKWOOD.

---

144 pages, handsomely bound, large, clear type, and fully illustrated with diagrams of connections, engravings, apparatus, etc.

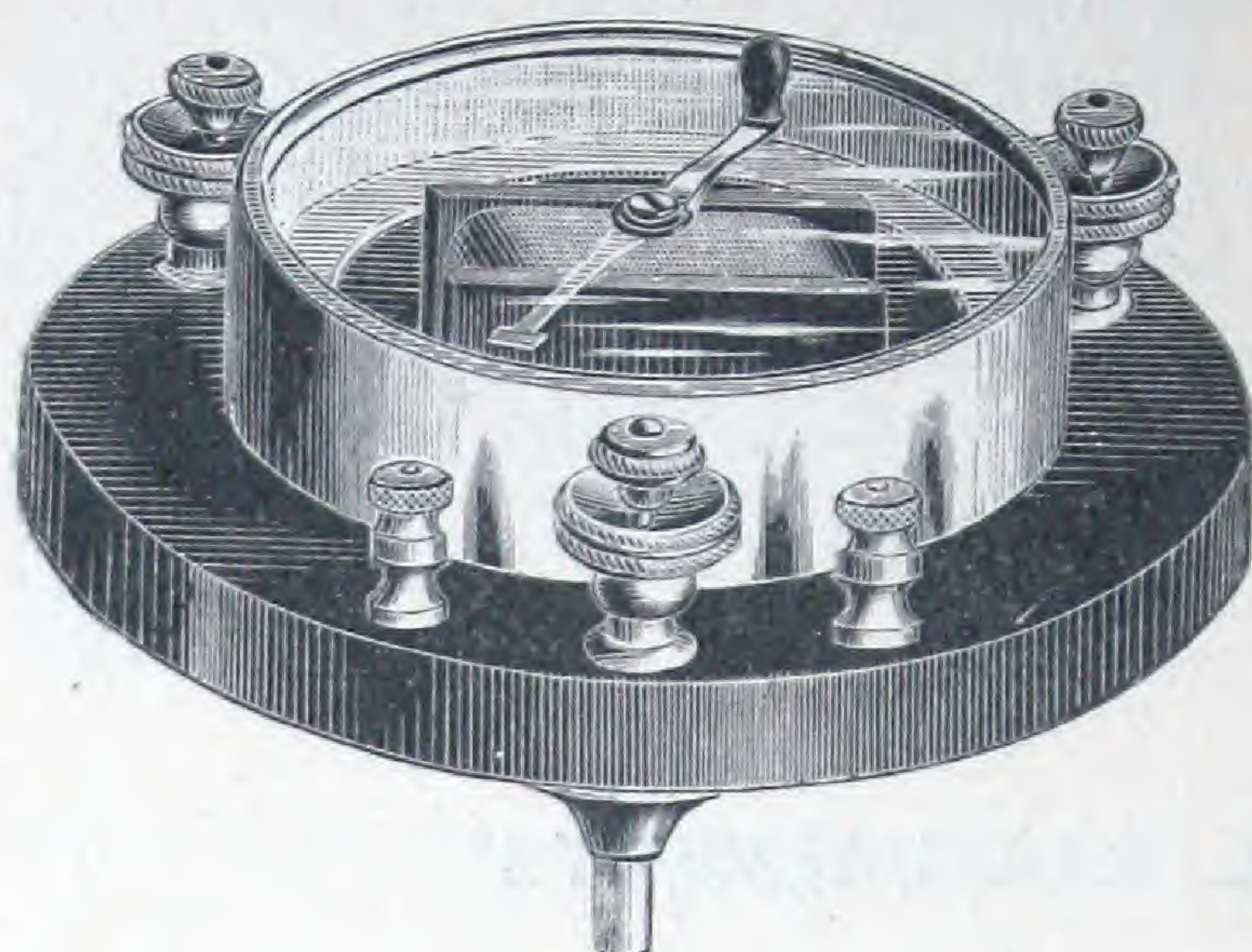
Sent by mail, post-paid, to any address, upon receipt of price, \$1.50.

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Every *Telegraph Office Manager*, or *Telegraph Operator*, every *Telephone, Central or District Telegraph Manager*, every *Student of Electrical Science*, every person having charge of electric light plant, or other electrical arrangements and apparatus, and every person who takes an interest in electrical matters of any kind, should own and read the above work. It is the only book which explains in plain English, and without algebraic formulæ, all about Electric Measurements and the use of Galvanometers and Rheostats. In this book the whole subject of *Electrical Measurement* is made so clear and plain than any one can easily understand every explanation, and can practically make electrical measurements without difficulty.



## OFFICE MEASUREMENT SETS.



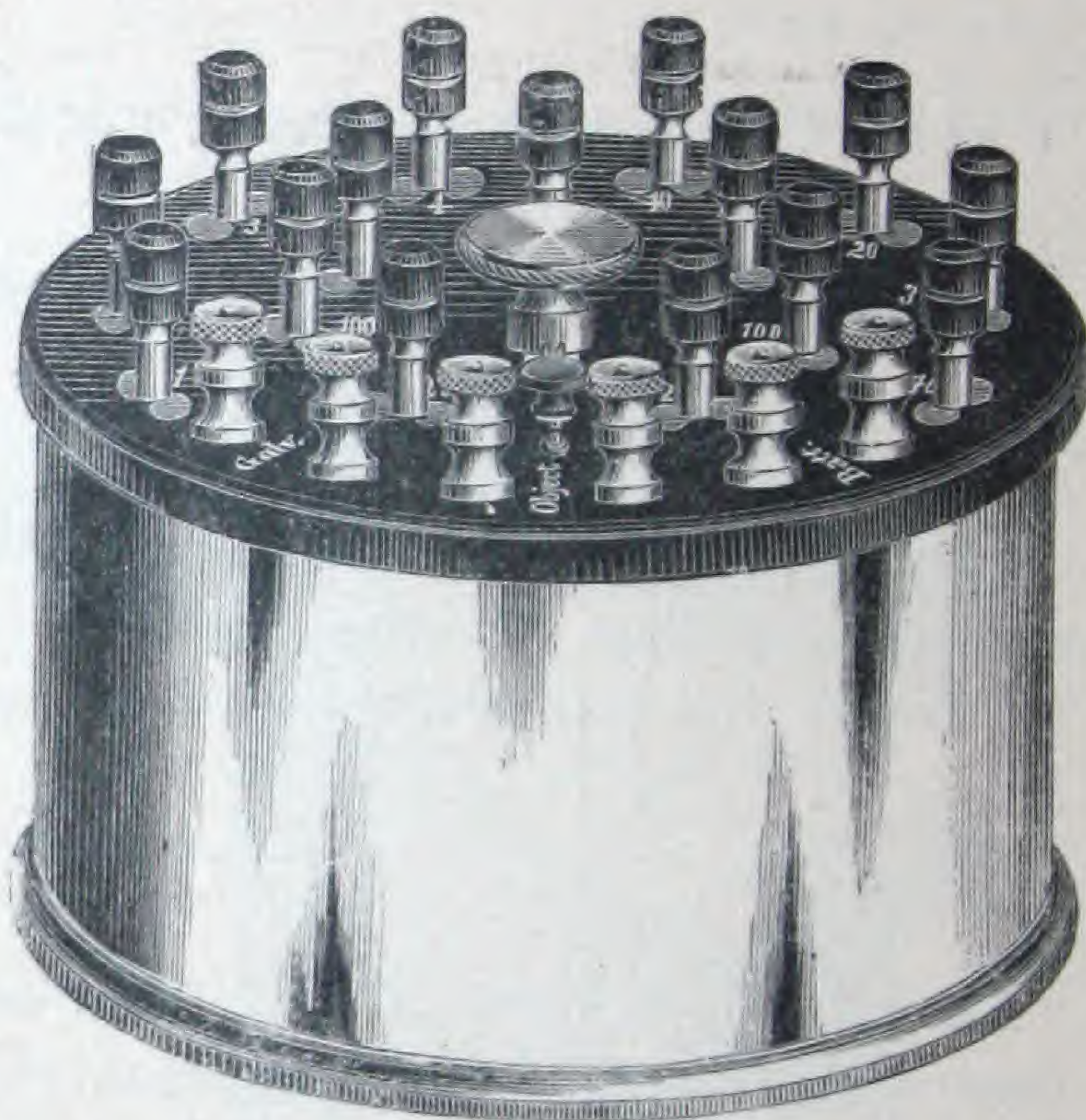
### GALVANOMETER, RHEOSTAT AND BRIDGE.

For all measurements between  $\frac{1}{10}$   
and 2,000 ohms.

### THE GALVANOMETER

is carefully constructed and highly sensitive. The RHEOSTAT is handsomely made and accurately adjusted to balance all resistances between  $\frac{1}{10}$  of an ohm and two thousand ohms.

Price, complete, \$60.00

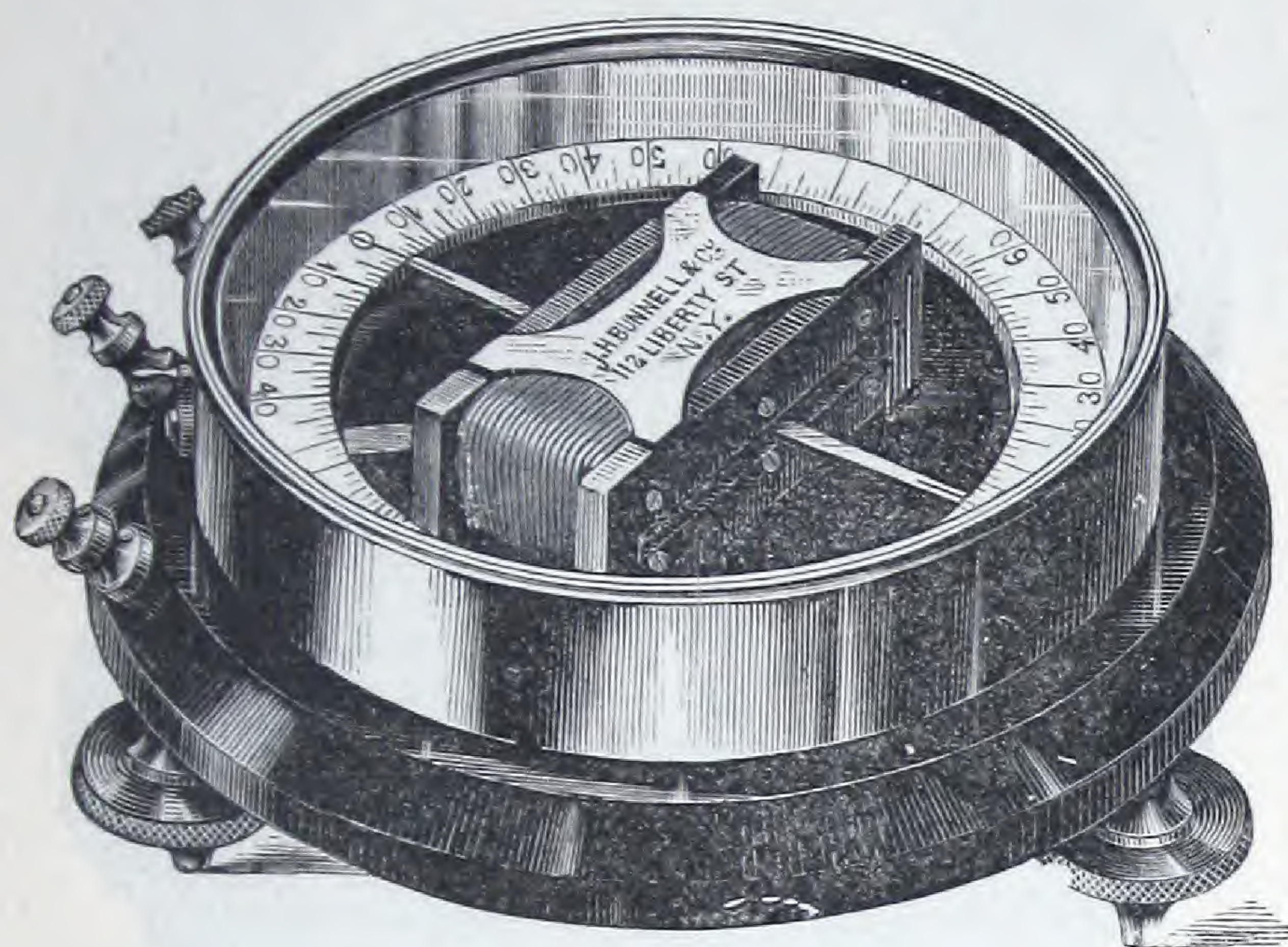


"Electrical Measurements, and the Galvanometer and its Uses," by *T. D. Lockwood*, giving plain instructions for the *Resistance Measurement* of Magnets, Batteries, Wires, etc., furnished with each set.



## Testing Galvanometers and Rheostats.

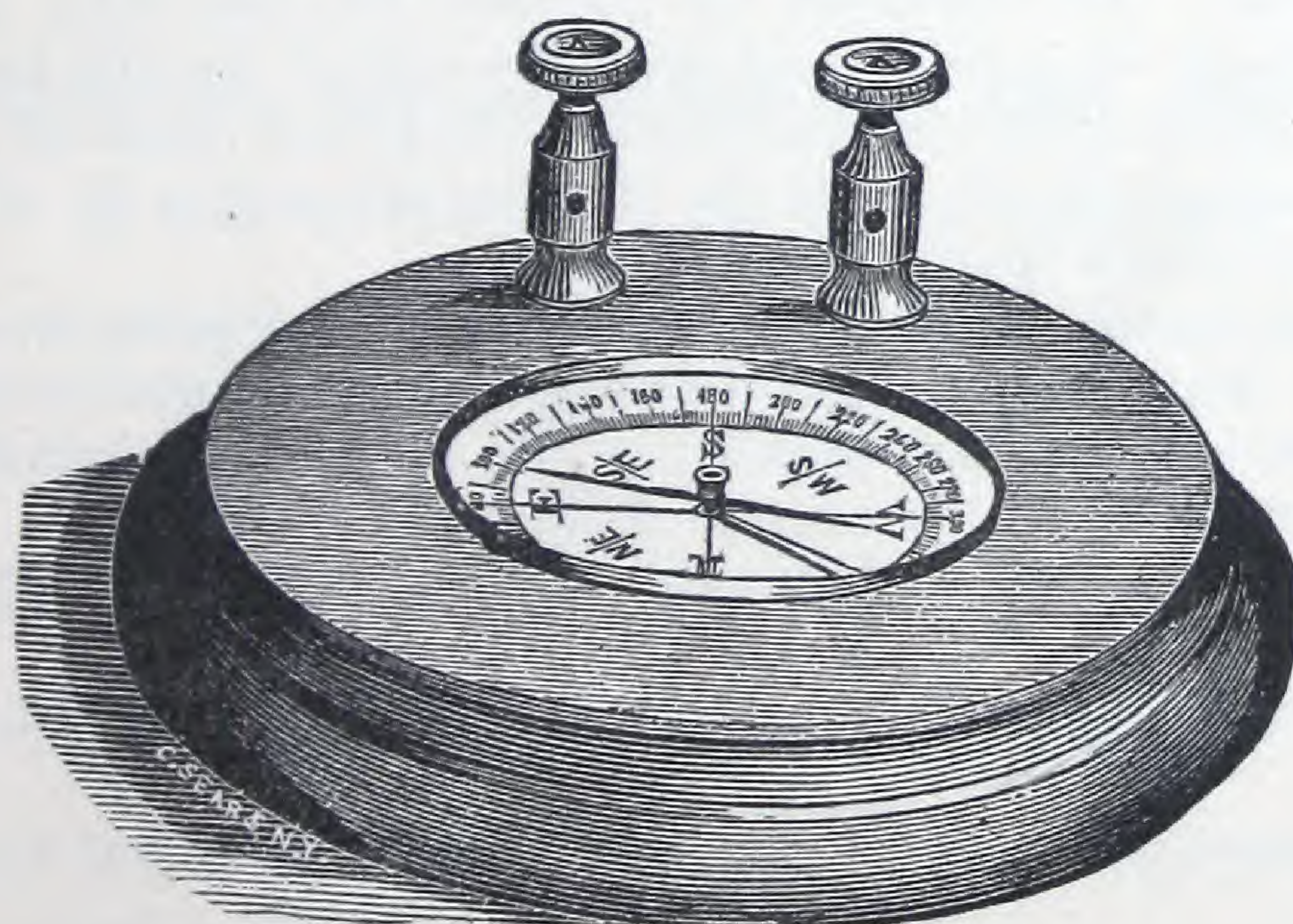
For electrical measurements of instruments, lines, batteries, and any objects of from  $\frac{1}{100}$  to 10,000 ohms or more. The Galvanometer is sensitive to the highest degree, and is at the same time most substantially and elegantly constructed, with especial reference to convenience in its practical use.



Price, single, . . . . . \$45.00

The above Galvanometer with Combined Bridge and Rheostat complete for all measurements from  $\frac{1}{100}$  to 10,000 ohms, in handsome Morocco case, . . . . . \$125.00

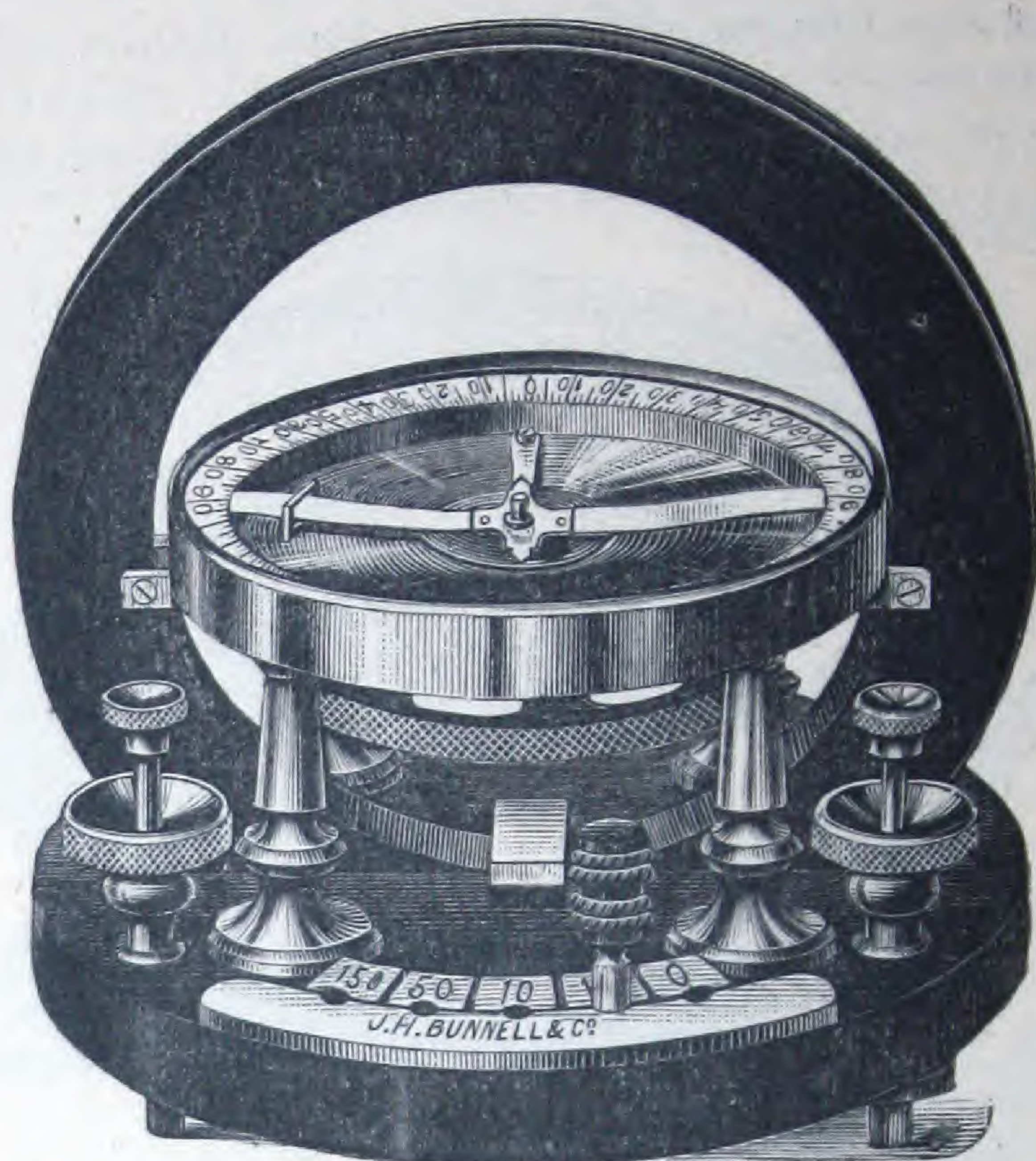
### DETECTOR GALVANOMETER.



Price, . . . . . \$4.00



## Western Union Standard Tangent Galvanometer.



This instrument is handsomely mounted on a circular hard rubber base,  $7\frac{3}{8}$  inches diameter, provided with leveling screws and anchoring points. The Galvanometer consists of a magnetized needle  $\frac{7}{8}$  inch in length, suspended at the centre of a rubber ring 6 inches in diameter, containing the coils. The coils are five in number, of the resistances, 0, 1, 10, 50, and 150 ohms. The first is a stout copper band of inappreciable resistance; the others are of different sized copper wires carefully insulated. Five terminals are provided, the plug holes of which are marked respectively—0, 1, 10, 50, and 200. The ends of the coils are so arranged that the plug inserted at the terminal marked 200, puts in circuit all the coils; at the terminal marked 50, all except the 150 ohm coil; and so on, till at the zero terminal only the copper band is in circuit.

Fixed to the needle, which is balanced on jewel and point, is an aluminum pointer at right angles, extending across a 5 inch dial immediately beneath. On one side the dial is divided into degrees; on the other it is graduated, the figures of the scale corresponding to the tangent of the angles of deflection.

When so ordered, the Galvanometer will be furnished with the needle suspended by a fibre of silk.

The Galvanometer is provided with a well-finished mahogany case and a strap for carrying it.

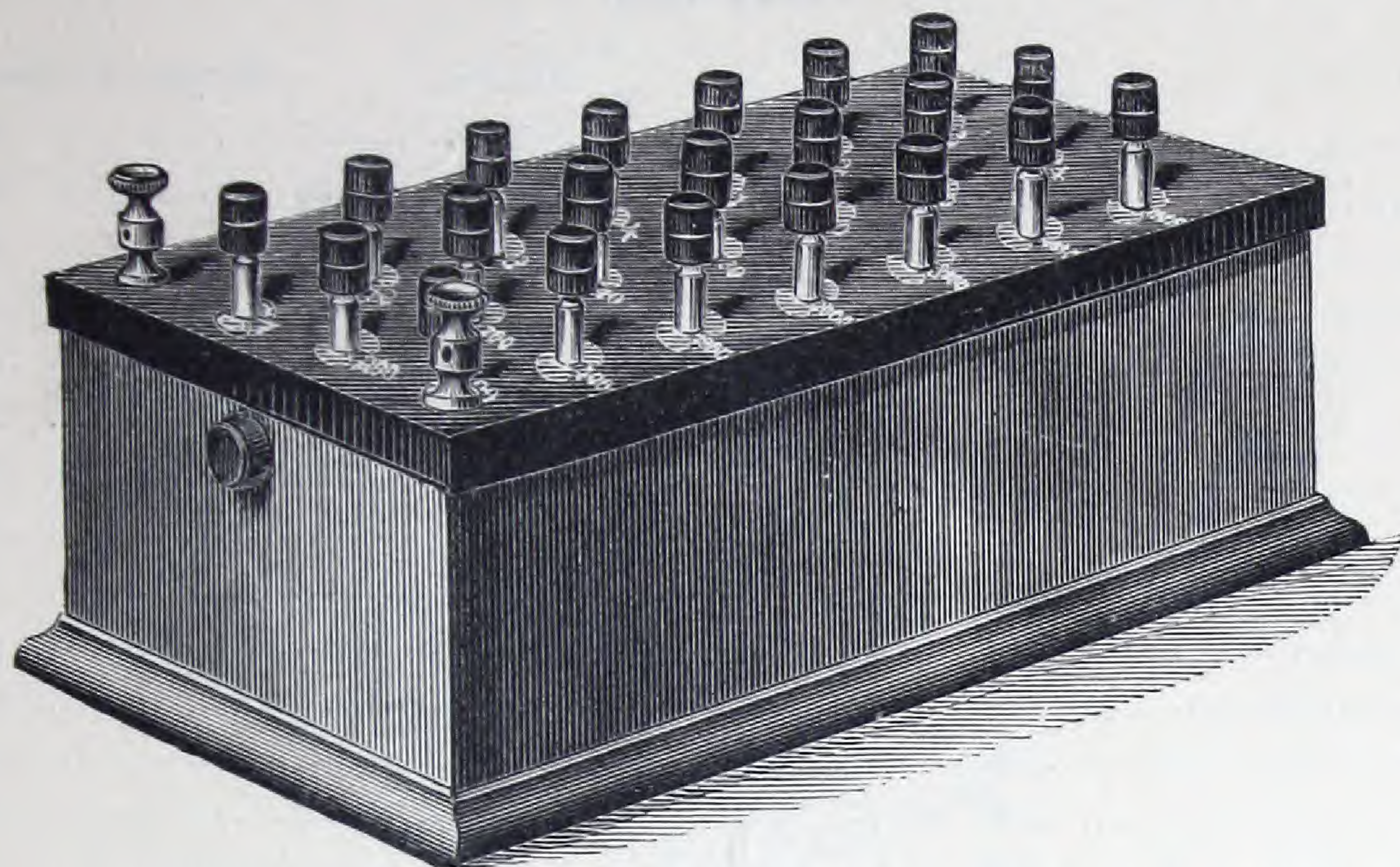
The instrument can be furnished to order with the coils wound to any specified resistance.

Price in Case, complete,

\$125.00



## STANDARD RHEOSTATS.



### IMPROVED SOLID TOP.

With Coils Carefully and Accurately Adjusted.

#### PRICES.

Standard Rheostats,	$\frac{1}{100}$ to 10,000 ohms,	\$65.00
"	" $\frac{1}{10}$ to 10,000 ohms,	55.00
"	" 1 to 10,000 ohms,	45.00
"	" $\frac{1}{100}$ to 2,000 ohms,	45.00
"	" $\frac{1}{10}$ to 2,000 ohms,	35.00
"	" 1 to 2,000 ohms,	30.00

Special Rheostats of any capacity or description furnished to order.

## DIFFERENTIAL GALVANOMETER AND RHEOSTAT.

As used for Fire Alarm and District Telegraphs.

Metallic circuit systems, and other measurements from  $\frac{1}{100}$  to 10,000 ohms. A very compact, handsome, and complete instrument in one case. Size, 8 inches diameter, 6 inches deep.

Price, \$85.00

## POCKET GALVANOMETER.

About the size of an ordinary watch, has closely fitting cover, and can be conveniently carried in the vest pocket.

Price, \$4.00

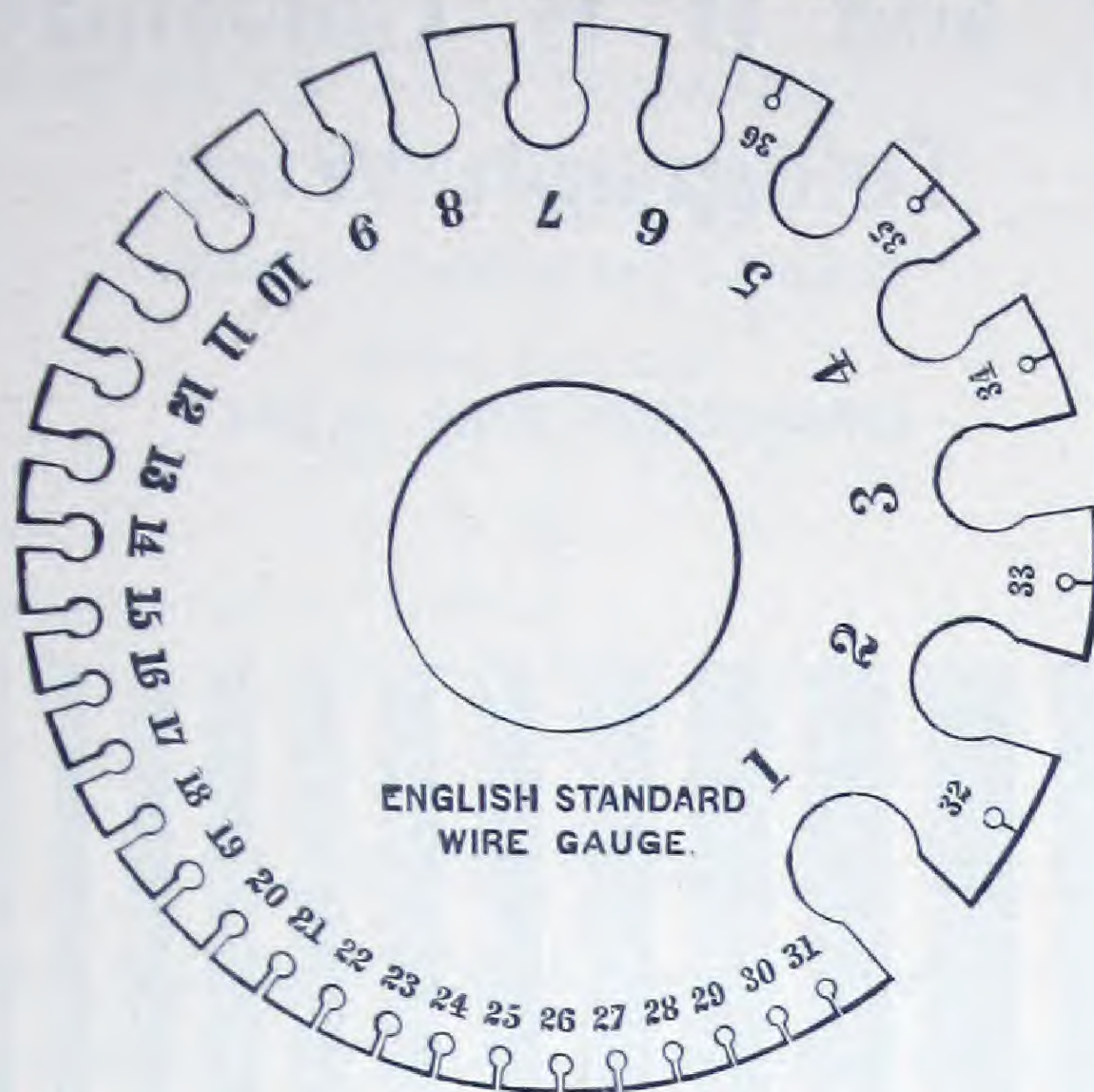


### TABLE SHOWING THE DIFFERENCE BETWEEN WIRE GAUGES.

<i>No.</i>	<i>London.</i>	<i>Stub's.</i>	<i>Brown &amp; Sharpe's.</i>
0000.....	.454	.454.....	.460
000.....	.425	.425.....	.40964
00.....	.380	.380.....	.36480
0.....	.340	.340.....	.32495
1.....	.300	.300.....	.28930
2.....	.284	.284.....	.25763
3.....	.259	.259.....	.22942
4.....	.238	.238.....	.20431
5.....	.220	.220.....	.18194
6.....	.203	.203.....	.16202
7.....	.180	.180.....	.14428
8.....	.165	.165.....	.12849
9.....	.148	.148.....	.11443
10.....	.134	.134.....	.10189
11.....	.120	.120.....	.09074
12.....	.109	.109.....	.08081
13.....	.095	.095.....	.07196
14.....	.083	.083.....	.06408
15.....	.072	.072.....	.05706
16.....	.065	.065.....	.05082
17.....	.058	.058.....	.04525
18.....	.049	.049.....	.04030
19.....	.040	.042.....	.03589
20.....	.035	.035.....	.03196
21.....	.0315	.032.....	.02846
22.....	.0295	.028.....	.025347
23.....	.027	.025.....	.022571
24.....	.025	.022.....	.0201
25.....	.023	.020.....	.0179
26.....	.0205	.018.....	.01594
27.....	.01875	.016.....	.014195
28.....	.0165	.014.....	.012641
29.....	.0155	.013.....	.011257
30.....	.01375	.012.....	.010025
31.....	.01225	.010.....	.008928
32.....	.01125	.009.....	.00795
33.....	.01025	.008.....	.00708
34.....	.0095	.007.....	.0063
35.....	.009	.005.....	.00561
36.....	.0075	.004.....	.005
37.....	.0065		.00445
38.....	.00575		.003965
39.....	.005		.003531
40.....	.0045		.003144



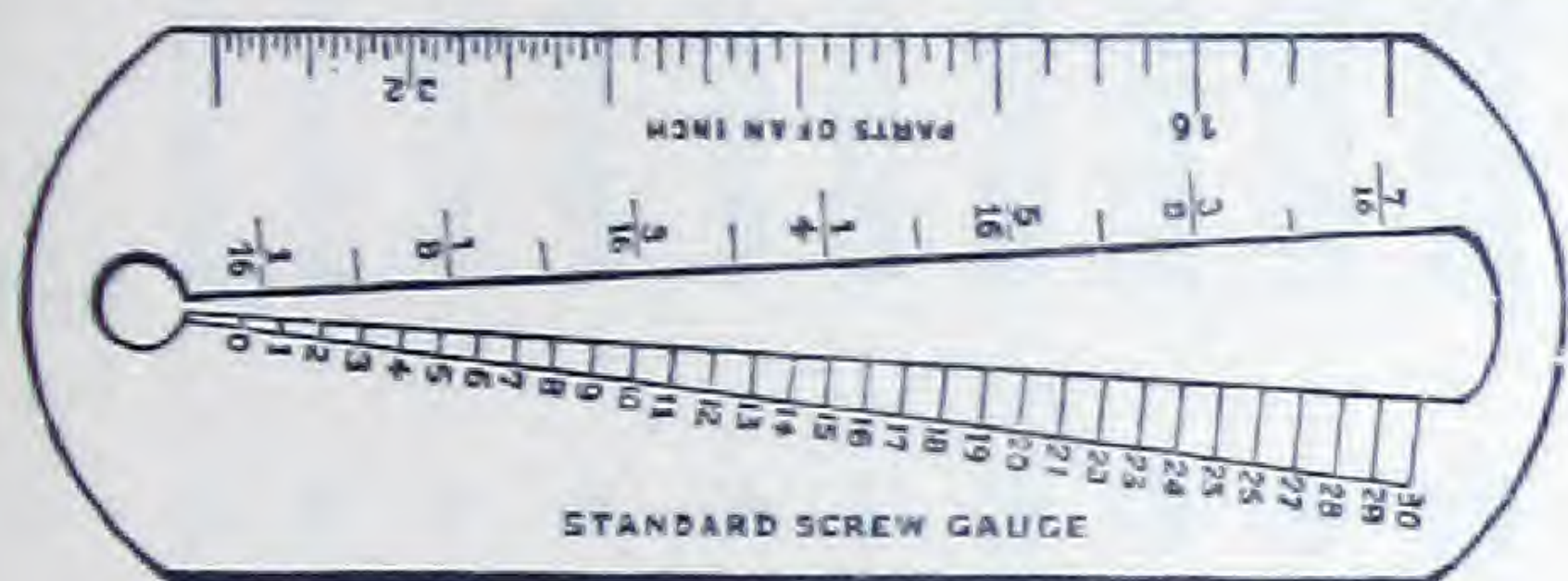
## WIRE GAUGES.



English Standard Wire Gauge,

\$2.50

### POCKET SCREW AND WIRE GAUGE.



FRONT SIDE.

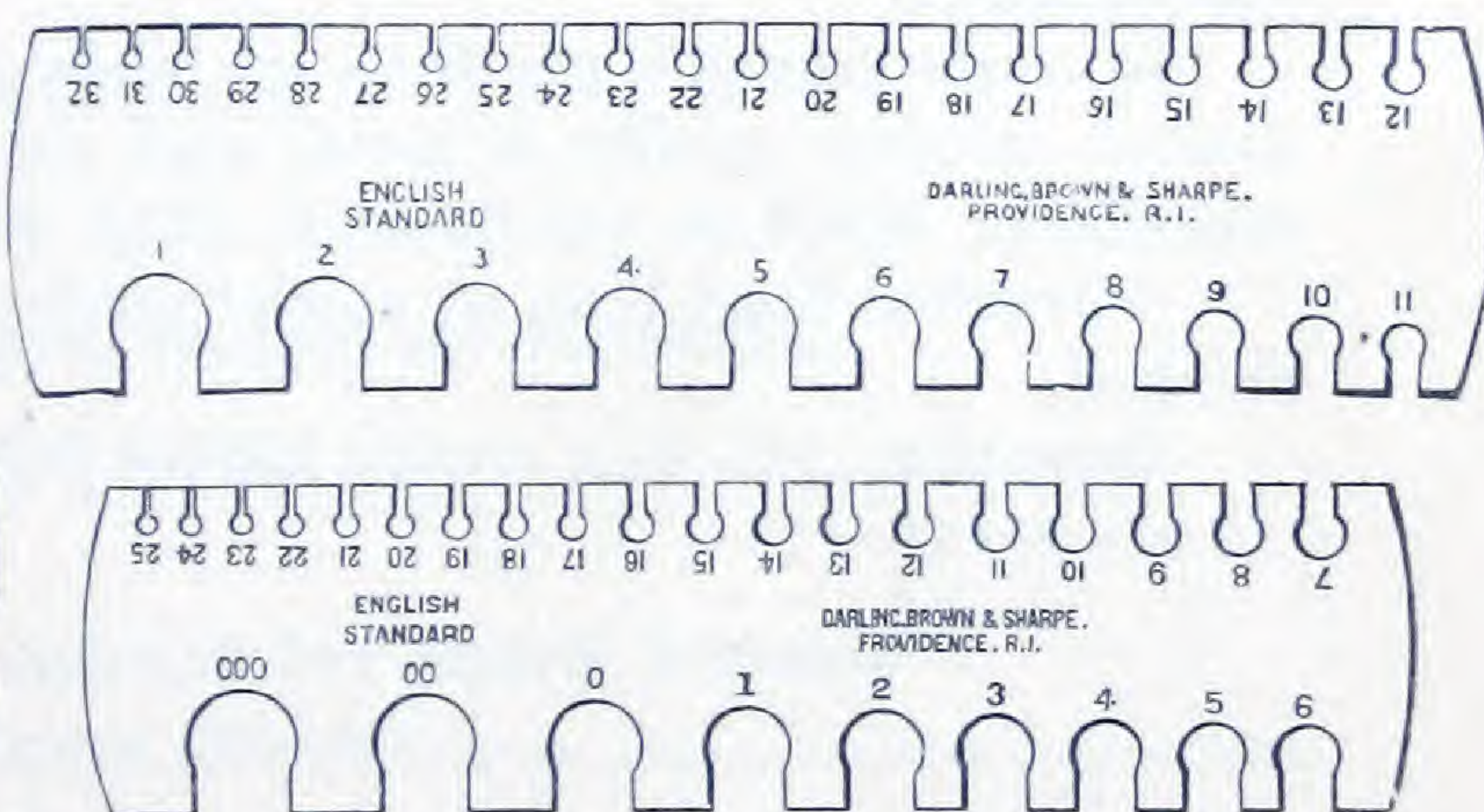


REVERSE SIDE.

On one side is a gauge for all sizes of screws and a rule for measuring the length of screws. The other side gauges all sizes of wire, by both American and English gauge, from 0000 to 17.

Price,

\$3.50



Cuts— $\frac{1}{8}$  size.

### OBLONG WIRE GAUGES.

#### PRICES.

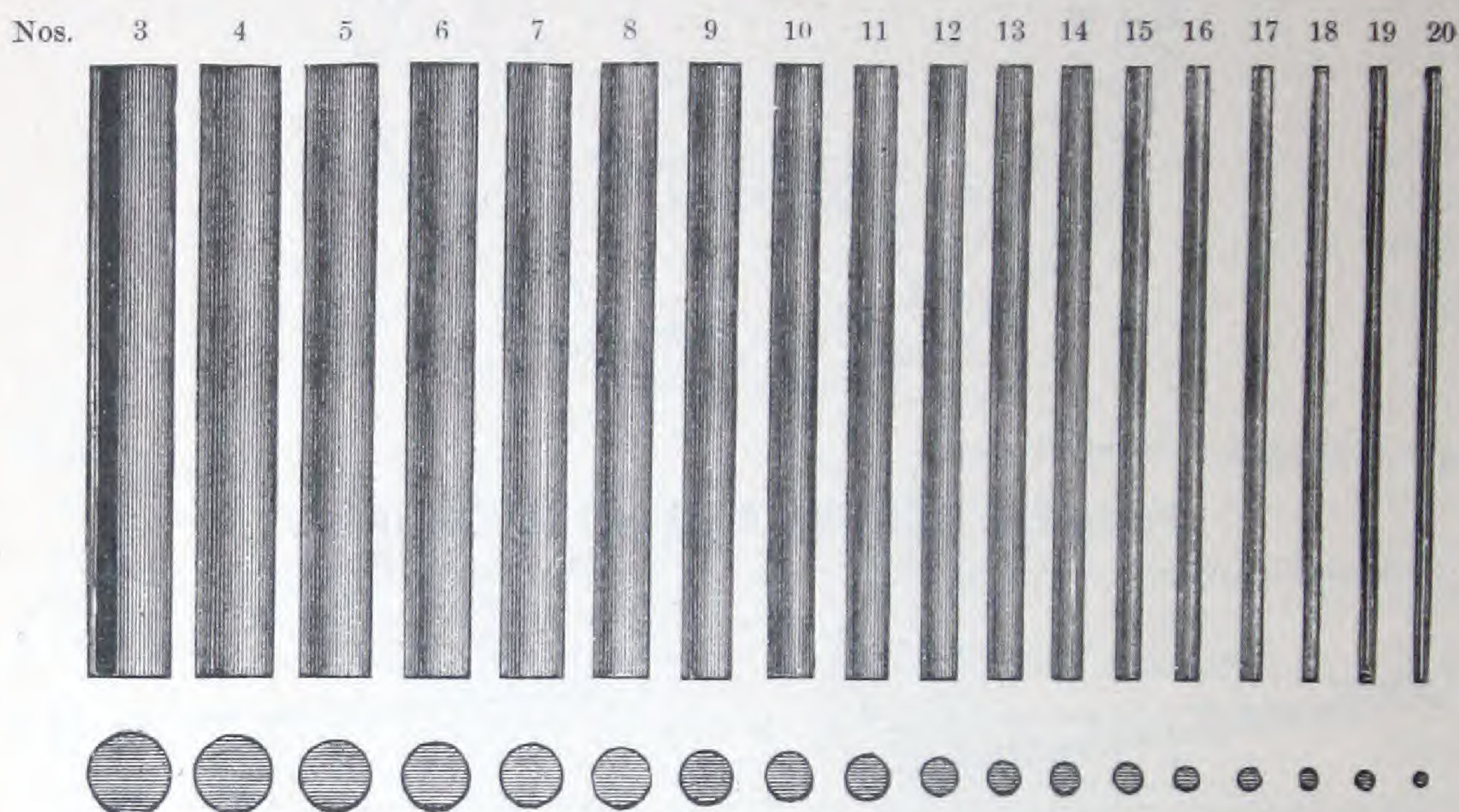
American Standard Wire Gauge,  
Price, 0 to 36, \$4.00    Price, 5 to 36, \$3.00

From Nos. 1 to 32, . . . . . \$3.00  
" " 000 to 25, . . . . . 2.50



## E. B. B. and B. B. Galvanized Iron Telegraph Wire.

### BIRMINGHAM WIRE GAUGE.



Believing the best to be always the cheapest, we keep in stock and are prepared to furnish our customers with the best grade of Galvanized Iron Wire for Telephone and Telegraph lines, of the celebrated John A. Roebling's Sons Co. manufacture.

In tensile strength, pliability, low resistance, or conductivity, galvanizing and general excellent quality of metal used, the wire of above manufacture has no superior.

Galvanized Steel Wire of special quality for Telephone use furnished when required.

Quotations, at lowest current market prices, given upon application.

#### Standard Weight and Resistance of Galvanized Wire:

No.	WEIGHT.	RESISTANCE.	No.	WEIGHT.	RESISTANCE.
6	550 lbs. per mile.	10. ohms.	11	216 lbs. per mile.	20. ohms.
7	470 " "	12.1 "	12	168 " "	32.7 "
8	385 " "	14.1 "	14	100 " "	52.8 "
9	330 " "	16.4 "	16	62 " "	91.6 "
10	268 " "				



**INSULATED GALVANIZED IRON WIRE.****FOR TELEPHONE AND TELEGRAPH PURPOSES.****BEST BEST.****Double Braided and Finished.**

Price, per mile.

No. 8 .....	\$50.00	No. 12 .....	\$40.00
" 9 .....	48.00	" 14 .....	38.00
" 10 .....	45.00	" 16 .....	35.00
" 11 .....	42.00		

**OFFICE WIRE.****Single Wound and Braided or Double Braided. Finished with Compound.****American, or Brown & Sharpe's Gauge.**

Nos. 12 to 20, in coils, 8 to 15 lbs.,	33 cts. per lb.
" " in smaller quantities,	35 " "

**Approximate Weights.****B. & S. GAUGE.**

No. 12.....	35 feet per lb.	No. 18.....	135 feet per lb.
" 14.....	52 " "	" 19.....	145 " "
" 16.....	90 " "	" 20.....	155 " "

All sizes and colors in stock.

**DOUBLE CONDUCTOR OFFICE WIRE.**

Two wires, Nos. 16 or 18 gauge,	33 cts. per lb.
---------------------------------	-----------------

**CALL BELL, ANNUNCIATOR AND BURGLAR ALARM WIRE.****Double Cotton Wrapped, Waxed, and Paraffined.****B. & S. GAUGE.**

Nos. 12 to 20, on spools, 8 to 10 lbs.,	32 cts. per lb.
" " smaller quantity,	34 " "

**Approximate Weights.**

No. 18,	150 feet per lb.
" 19,	200 " "
" 20,	225 " "

Triple wound and finished, for special use in Telephone Switch Boards and connections.

Nos. 12 to 20,	32 cts. per lb.
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## GAS FIXTURE WIRE.

Triple Covered for Lighting Gas by Electricity.

White, Yellow or Brown.

### PRICES.

No. 12, per lb.....	\$ .40	No. 22, per lb.....	\$ .90
" 15, " .....	.42	" 24, " .....	1.00
" 18, " .....	.45	" 26, " .....	1.37

## OFFICE WIRE CABLES.

From 10 to 100 conductors made of No. 20 B. & S. Gauge copper wire (or larger if desired), covered with cotton, compactly cabled together, and braided in any color, or combination of colors, finished with compound.

Price, per lb., . . . . . 35 cts.

## LEAD ENCASED WIRE.

Any number of wires desired can be encased in a single LEAD PIPE, making a durable and perfect article, where extra protection and safety are necessary.

### No. 14, 16 or 18, Brown & Sharpe's Gauge Copper Wire.

	Per foot.
1, Wire, braided covering, with compound.....	.06 cts.
2, " " " " " " .....	.07 "
3, " " " " " " .....	.08 "
4, " " " " " " .....	.09 "
5, " " " " " " .....	.10 "
6, " " " " " " .....	.11 "
7, " " " " " " .....	.12 "
8, " " " " " " .....	.13 "
9, " " " " " " .....	.14 "
10, " " " " " " .....	.15 "



## INSULATED MAGNET WIRES.

Pure Copper Wire, finely and evenly wrapped, of regular resistance and uniform diameter.

### AMERICAN OR BROWN & SHARPE'S GAUGE.

AM. GAUGE. No.	COTTON COVERED.		SILK COVERED.		BARE COPPER.	
	Feet per lb.	Price.	Feet per lb.	Price.	Feet per lb.	Price.
8		\$		\$	20	\$
9					25	
10					32	
11					40	
12	42	.45	46	1.12	50	.30
13	55	.45	60		64	
14	68	.45	75		80	
15	87	.50	95		101	
16	110	.50	120		128	.31
17	140	.60	150	1.15	161	.31½
18	175	.60	190		203	.32
19	220	.65	240	1.15	256	.32
20	280	.70	305	1.18	324	.33
21	360	.70	390	1.20	408	.34
22	450	.76	490	1.30	514	.38
23	560	.85	615	1.42	649	.40
24	715	.90	775	1.56	818	.43
25	910	1.00	990	1.81	1,030	.46
26	1,165	1.10	1,265	2.10	1,300	.54
27	1,445	1.25	1,570	2.25	1,640	.62
28	1,810	1.35	1,970	2.38	2,070	.67
29	2,280	1.50	2,480	2.75	2,617	.73
30	2,805	1.65	3,050	2.95	3,287	.82
31	3,605	1.80	3,920	3.25	4,144	.95
32	4,535	1.95	4,930	3.45	5,227	1.30
33			6,200		6,590	1.50
34		2.85	7,830	4.25	8,330	1.70
35		3.25	9,830	5.85	10,460	2.00
36		4.37	12,420	7.00	13,210	3.25

The above prices are for quantities of one pound or more. *Less than one pound*, twenty per cent. advance on pound prices will be charged.

For double wound, either in silk or cotton, add one-half the difference between price of bare and covered wire.



## ELECTRIC LIGHT MAGNET WIRE.

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Single	Wound, Nos.	0 to 15.....	35	cts. per lb.
Double	"	" 0 to 15.....	37	" "
Triple	"	" 0 to 15.....	45	" "
Quadruple	"	" 0 to 15.....	50	" "
Single	"	" 16 to 20.....	40	" "
Double	"	" 16 to 20.....	44	" "
Triple	"	" 16 to 20.....	55	" "
Quadruple	"	" 16 to 20.....	60	" "

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## ELECTRIC LIGHT LINE WIRE.

Double Braided and Finished, with Fire- or Weather-proof Compound, or in Office Wire Finish.

Nos.	0 to 12, per lb. net.....	25	cts.
"	13 to 18, " " .....	29	" "

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## FLEXIBLE ELECTRIC LIGHT WIRE.

Conductor composed of fine copper wire in strand, equal to No. 0, 2, 4, 6 or 8, B. & S. Gauge solid wire.

Double Braided and Finished with Fire- or Weather-proof Compound, or in Office Wire Finish.

Made of No. 19 Wire.....	25	cts. per lb.
" " 23 " .....	50	" "
" " 25 " .....	60	" "

Other sizes and styles subject to special rates.



**APPROXIMATE WEIGHTS**  
OF  
**Fire-Proof Electric Light Line Wire.**

**BROWN & SHARPE'S GAUGE.**

No.	00.....	458 lbs. per 1000 feet.
"	0 .....	356    "    "
"	1 .....	299    "    "
"	2 .....	243    "    "
"	3 .....	203    "    "
"	4 .....	168    "    "
"	5 .....	118    "    "
"	6 .....	107    "    "
"	7 .....	83    "    "
"	8 .....	70    "    "
"	9 .....	54    "    "
"	10 .....	47 $\frac{1}{4}$ "    "
"	11 .....	39 $\frac{1}{4}$ "    "
"	12 .....	33 $\frac{3}{4}$ "    "
"	13 .....	28    "    "
"	14 .....	24    "    "
"	15 .....	19    "    "
"	16 .....	16 $\frac{1}{2}$ "    "
"	17 .....	14 $\frac{1}{4}$ "    "
"	18 .....	13 $\frac{1}{4}$ "    "
"	19 .....	13    "    "
"	20 .....	11 $\frac{1}{2}$ "    "

**PLATINUM WIRE.**

**B. & S. GAUGE.**

No. 12, per inch.....	\$ .80	No. 26, per foot.....	\$ .60
" 14,    " .....	.50	" 28,    " .....	.50
" 16,    " .....	.35	" 30,    " .....	.30
" 18,    " .....	.25	" 32,    " .....	.20
" 20,    " .....	.20	" 34,    " .....	.15
" 22,    " .....	.15	" 36,    " .....	.10
" 24,    " .....	.08	" 40,    " .....	.08



## CLARK INSULATED WIRE CO.'S COPPER WIRE, TINNED.

Rubber Insulation, with Braided Covering, for House, Railroad, Telegraph, Telephone, Battery and Incandescent work. Water, air, earth, acid and oil proof.

B. W. GAUGE.	INSULATION 32d of an In.	PRICE per 100 ft.	B. W. GAUGE.	INSULATION 32d of an In.	PRICE per 100 ft.
22	3½	\$1.75	14	6	\$3.75
20	3½	1.75	14	7	4.00
20	4	1.80	14	8	4.25
19	4	1.90	14	9	5.00
18	4	2.00	12	8	6.00
18	5	2.25	12	10	7.00
18	6	2.50	10	10	7.50
16	6	3.00	8	14	10.00
16	7	3.50	6	14	12.00
16	8	3.75	4	16	13.00

## PATENT COATING WITH TWO BRAIDS, AND WITHOUT RUBBER, FOR AERIAL CIRCUITS.

COPPER WIRE.			IRON WIRE.		
No. 4, 6, 8, per foot,	7½ cts.		Extra B. B. Galvanized.		
" 10, "	6½ "		No. 8 to 12, per foot.	2¾ cts.	
" 12, "	6 "		" 14, "	2½ "	

We also furnish Clark's Cables for Telephone and Telegraph work.

## GUTTA-PERCHA INSULATION.

No. 12, (38 ft. to 1 lb.,) per ft., 5 cts., per lb., \$1.50	No. 20, (175 ft. to 1 lb.,) per ft., 2 cts., per lb., \$2.35
" 14, (55 " " ) " 3½ " " 1.60	" 22, (230 " " ) " 1½ " " 2.60
" 16, (72 " " ) " 3 " " 1.75	" 24, (330 " " ) " 1½ " " 3.25
" 18, (126 " " ) " 2 " " 2.10	" 26, (480 " " ) " 1 " " 3.75
No. 8 Copper Wire, covered with Gutta-Percha and Braid,	
" 6 " " " " " " " " " "	per ft., 10 cts.
	" 11 "

## OKONITE INSULATED WIRES.

For Telephone, Telegraph, and Office use. Birmingham Wire Gauge.

Price per foot, No. 12,	6½ cts.
" " " 14,	5 "
" " " 16,	4 "
" " " 18,	3½ "
" " " 20,	2½ "



**GERMAN SILVER STANDARD RESISTANCE WIRE.**

WOUND WITH COTTON OR SILK.

AMERICAN OR BROWN &amp; SHARPE'S GAUGE.

No.	COTTON.	SILK.	RESIST'E.	No.	COTTON.	SILK.	RESIST'E.
16	\$1.40	\$1.85	2.620	28	\$2.45	\$3.42	713.5
17	1.40	1.85		29	2.60	3.85	
18	1.40	1.85	8.800	30	2.84	4.14	1215
19	1.40	1.85		31	3.09	4.52	
20	1.42	1.88	27.80	32	3.59	4.94	2250
21	1.44	1.93		33	3.96	5.46	
22	1.52	2.06	66.10	34	4.61	5.84	4658
23	1.62	2.21		35	5.01	7.52	8136
24	1.71	2.37	119.6	36	8.09	10.00	11990
25	1.84	2.65		37	13.00	18.50	
26	2.05	3.02	358.4	38	24.00	28.00	24620
27	2.25	3.23					

German Silver wire is employed for Rheostats, Resistance Coils, and other parts of apparatus in which high resistance is required. It possesses great permanence, and the variation in its resistance, due to changes of temperature, is small. Its co-efficient is 0.0004, copper being 0.0038—that is, ten times less. Its resistance per metre gramme is 1.85 ohm, while copper is 0.144 ohm.

**PRICE-LIST****BARE GERMAN SILVER RESISTANCE WIRE.**

AMERICAN OR BROWN &amp; SHARPE'S GAUGE.

No.	Per lb.	No.	Per lb.
20.....	\$ .79	30 .....	\$1.75
21.....	.82	31.....	1.95
22.....	.90	32.....	2.35
23.....	.90	33.....	2.60
24.....	.95	34.....	2.95
25.....	1.00	35.....	3.65
26.....	1.25	36.....	6.50
27.....	1.30	37.....	11.50
28.....	1.40	38.....	18.00
29.....	1.55		



## TELEPHONE AND SWITCH CORDS.

Our new style flexible cordage consists of two concentric spirals of brass and steel wire on a cord centre, finished either in worsted or silk.

### SWITCH CORDS.

Worsted,	per yard, 10 cts.
Silk,	" 15 "

### DOUBLE TELEPHONE CORDS.

With Sustaining Cord to relieve strain on Tips. Will outlast two ordinary cords.

Price, Worsted,	25 cts.
" in lots of 1,000,	20 "
" Silk,	35 "

### TELEPHONE CORDS, TINSEL CONDUCTOR.

Price, Worsted, each,	20 cts.
" Silk,	25 "
Five Conductor Tinsel Cord, per yard,	23 "

### INCANDESCENT LAMP CORD.

For Portable Brackets, Etc.

Insulated with cotton, rubber and silk. Two conductors, twisted or flat.

Equal to No. 21 B. & S. Wire,	per yard, 15 cts.
" " " 19 " "	" " 20 "



## CONDUCTING CORDS.

No. 1—One Conductor of 16 No. 33 copper wires in strand, with green or red silk braid cover. Per yard.....	12 cts.
No. 2—One Conductor of 16 No. 31 copper wires in strand, with green or red silk braid cover. Per yard.....	16 cts.
No. 3—Two Conductors of 5 No. 30 copper wires in strands, with green silk braid covers. Per yard.....	20 cts.
No. 4—Two Conductors of 16 No. 33 copper wires in strands, with green silk braid covers. Per yard.....	25 cts.
No. 5—Two Conductors of 30 No. 33 copper wires in strands, with heavy green silk braid covers. Per yard.....	35 cts.
No. 6—One Conductor of 8 No. 36 copper wires in strands, with drab colored cotton braid cover. Per yard.....	6 cts.
No. 9—One Conductor of copper wires, wound spirally on a strong cord, with checked green, red and white cotton braid cover. Per yard...	8 cts.
No. 10—One Conductor of copper wires, wound spirally on a strong cord, same as No. 9 except smaller in size, with green cotton braid cover. Per yard.....	6 cts.
No. 11—Two Conductors, heavy switch cord, Western Union style, each conductor composed of 10 flat copper wires, wound spirally on cord, each conductor heavily wrapped with silk and covered with heavy green silk. Per yard.....	50 cts.
No. 12—One Conductor of 50 No. 32 copper wires, with green and gold colored silk braid cover. For Rheostats and other purposes where large and flexible conductors are required. Per yard.....	35 cts.
No. 13—One Conductor, tinsel cord, with lateral cotton and double wrap of cotton cover, red and green colors. Much used for Kidder and other medical battery electrodes. Per yard.....	15 cts.
No. 15—Two Conductors of 14 No. 33 copper wires in strands, insulated with silk, and laid up in form of three-strand cord, covered with green, crimson, or blue colored silk. This cord is generally used for pear shape push buttons. Per yard.....	25 cts.
No. 21—One Conductor, tinsel cord, covered with red or green worsted braid. Per yard.....	10 cts.
No. 22—Two Conductors, tinsel cord, one conductor covered with blue and the other with red worsted braid, the whole covered with fine blue and red worsted braid. Per yard.....	20 cts.
No. 23—One Conductor, tinsel cord, covered with green or crimson silk braid. Per yard, 15 cts. Same cord, two Conductors, per yard.....	25 cts.
No. 24—One Conductor, tinsel cord, one wrap of worsted and two cotton braids outside. For Telephone switches. Per yard.....	15 cts.
No. 26—Two Conductors of 25 No. 36 cotton wires, each Conductor insulated with a wrap of cotton, a layer of gutta-percha, and an outside braid of red, blue and gold colored silk. This is an entirely water-proof cord, much used for chandeliers in electric lighting. Per yard.....	35 cts.
No. 28—Gold Tinsel Cord, not covered, small size. Per yard.....	5 cts.
No. 29—Gold Tinsel Cord, not covered, large size. Per yard.....	8 cts.
Silver-plated Tips for conducting cords. Price of Tips, each 2 cts. Price of Tips attached to cords, each.....	5 cts.



# NUMBER, DIAMETER, WEIGHT, LENGTH, AND RESISTANCE OF PURE COPPER WIRE.

## AMERICAN GAUGE.

No.	DIAM.	WEIGHT SP. GR. 8.889		LENGTH	RESISTANCE OF PURE COPPER AT 70° FAHRENHEIT.		
	Inches.	Grs. per Foot	Lbs. per 1000 Feet	Feet per Lb.	Ohms per 1000 Feet	Feet per Ohm	Ohms per Lb.
0000	.460	4475.33	639.33	1.56	.051	19605.69	.0000798
000	.40964	3549.07	507.01	1.97	.064	15547.87	.000127
00	.36480	2814.62	402.09	2.49	.081	12330.36	.000202
0	.32495	2233.28	319.04	3.13	.102	9783.63	.000320
1	.28930	1770.13	252.88	3.95	.129	7754.66	.00051
2	.25763	1403.79	200.54	4.99	.163	6149.78	.000811
3	.22912	1113.20	159.03	6.29	.205	4876.73	.001289
4	.20431	882.85	126.12	7.93	.259	3867.62	.00205
5	.18194	700.10	100.01	10.00	.326	3067.06	.00326
6	.16202	555.20	79.32	12.61	.411	2432.22	.00518
7	.14428	440.27	62.90	15.90	.519	1928.75	.00824
8	.12849	349.18	49.88	20.05	.654	1529.69	.01311
9	.11443	276.94	39.56	25.28	.824	1213.22	.02083
10	.10189	219.57	31.37	31.88	1.040	961.91	.03314
11	.09074	174.15	24.88	40.20	1.311	762.93	.05269
12	.08081	138.11	19.73	50.69	1.653	605.03	.08377
13	.07196	109.52	15.65	63.91	2.084	479.80	.13321
14	.06408	86.86	12.41	80.59	2.628	380.51	.2118
15	.05706	68.88	9.84	101.63	3.314	301.75	.3368
16	.05082	54.63	7.81	128.14	4.179	239.32	.5355
17	.04525	43.32	6.19	161.59	5.269	189.78	.8515
18	.04030	34.35	4.91	203.76	6.645	150.50	1.3539
19	.03589	26.49	3.78	264.26	8.617	116.05	2.2772
20	.03196	21.61	3.09	324.00	10.566	94.65	3.423
21	.02846	17.13	2.45	408.56	13.323	75.06	5.443
22	.025347	13.59	1.94	515.15	16.799	59.53	8.654
23	.022571	10.77	1.54	649.66	21.185	47.20	13.763
24	.0201	8.54	1.22	819.21	26.713	37.44	21.885
25	.0179	6.78	.97	1032.96	33.684	29.69	34.795
26	.01594	5.37	.77	1302.61	42.477	23.54	55.331
27	.014195	4.26	.61	1642.55	53.563	18.68	87.979
28	.012641	3.38	.48	2071.22	67.542	14.81	139.893
29	.011257	2.68	.38	2611.82	85.170	11.74	222.449
30	.010025	2.13	.30	3293.97	107.391	9.31	353.742
31	.008928	1.69	.24	4152.22	135.402	7.39	562.221
32	.00795	1.34	.19	5236.66	170.765	5.86	894.242
33	.00708	1.06	.15	6602.71	215.312	4.64	1421.646
34	.0063	.84	.12	8328.30	271.583	3.68	2261.82
35	.00561	.67	.10	10501.35	342.443	2.92	3596.104
36	.005	.53	.08	13238.83	431.712	2.32	5715.36
37	.00445	.42	.06	16691.06	544.287	1.84	9084.71
38	.003965	.34	.05	20854.65	686.511	1.46	14320.26
39	.003531	.27	.04	26302.23	865.046	1.16	22752.6
40	.003144	.21	.03	33175.94	1091.865	.92	36223.59



# WINDOW TUBES.

HARD RUBBER, WITH HEADS.



No. 4 Window Tube, Finished.



No. 4 Window Tube, Rough.

No.	Length	Outside diam.	Hole	Rough. Each.	Finished. Each.
1,	1½ inches long,	$\frac{7}{16}$	$\frac{1}{4}$ inch hole,	3 cts.	4½ cts.
2,	1½ "	$\frac{7}{16}$	"	3 "	4½ "
3,	2½ "	$\frac{7}{16}$	"	4 "	6 "
4,	2½ "	$\frac{1}{2}$	"	4½ "	7½ "
5,	3 "	$\frac{7}{16}$	"	5 "	9 "
6,	4 "	$\frac{7}{16}$	"	6 "	10 "
7,	6 "	$\frac{7}{16}$	"	9 "	13 "
8,	3 "	$\frac{9}{16}$	"	7 "	11 "
9,	4 "	$\frac{9}{16}$	"	9 "	13 "
10,	6 "	$\frac{9}{16}$	"	12 "	16 "
11,	8 "	$\frac{9}{16}$	"	15 "	20 "
12,	4 "	$\frac{5}{8}$	"	10 "	14 "
13,	8 "	$\frac{5}{8}$	"	16 "	21 "
14,	12 "	$\frac{3}{4}$	"	25 "	31 "
15,	8 "	$\frac{3}{4}$	"	21 "	26 "
16,	12 "	$\frac{3}{4}$	"	31 "	42 "

Window Tubing in 24 inch pieces,  $\frac{1}{2}$  inch outside diam.,  $\frac{1}{4}$  inch hole, 35 cts. each.  
 " " 24 "  $\frac{9}{16}$  "  $\frac{5}{16}$  hole for large wire, 40 "

## SOFT RUBBER TUBING, PURE GUM.

In Lengths of Fifty Feet. Diagram shows Full Size.

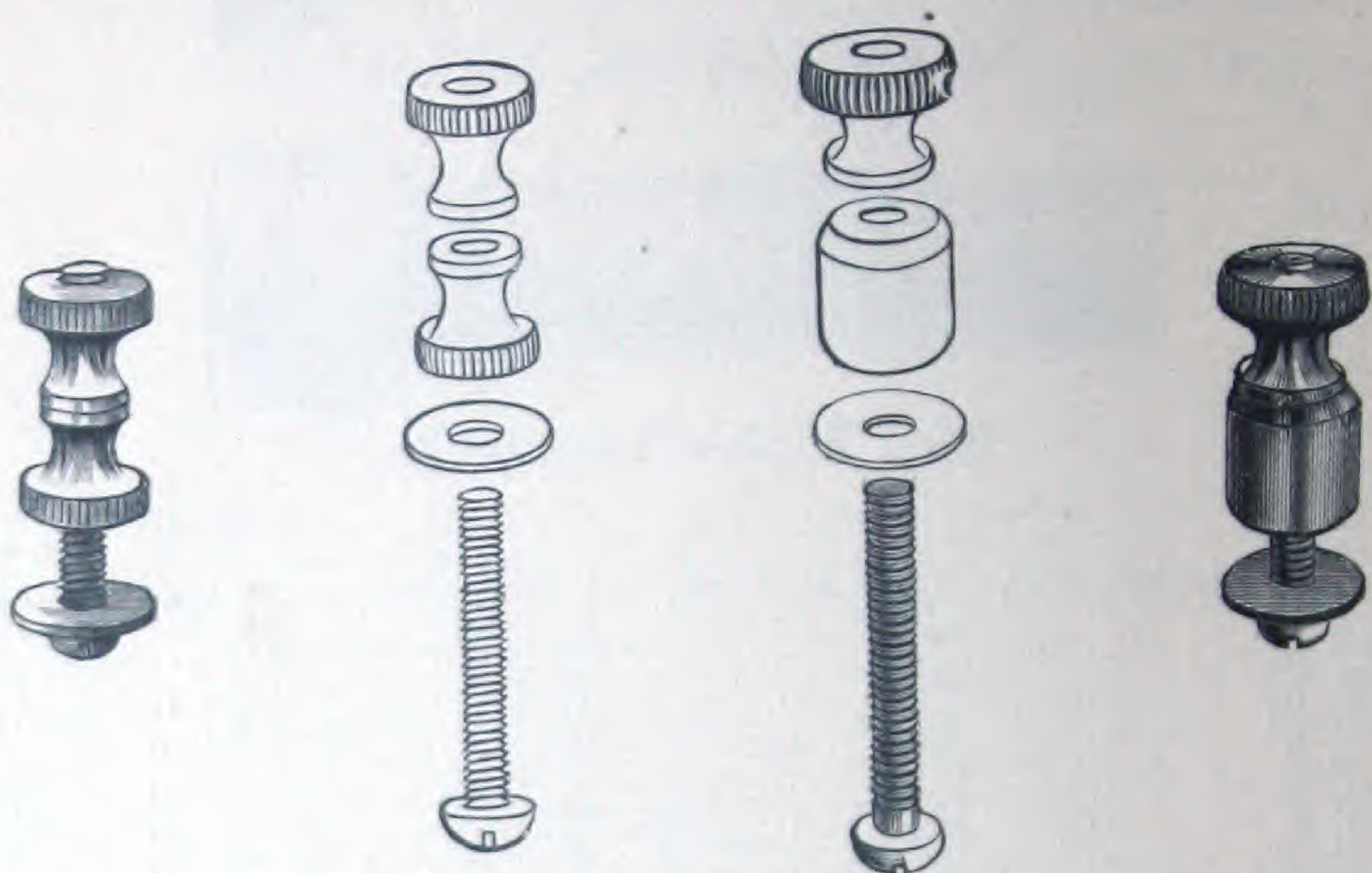


Inside Diam.,  $\frac{1}{2}$   $\frac{3}{8}$   $\frac{5}{16}$   $\frac{1}{4}$   $\frac{3}{16}$   $\frac{1}{8}$   $\frac{3}{32}$   $\frac{2}{32}$   $\frac{1}{32}$  inch.  
 Per foot, 25 20 18 16 12 8 4 3 3 cents.



## BINDING POSTS.

### THE NOVELTY DESIGN BINDING POST.



No. 500.

No. 501.

This is one of the strongest, neatest and cheapest binding posts made, and consists of four pieces, as shown above. It insures a much better and more reliable contact than the ordinary binding post, and avoids mashing the ends of the wire. While we manufacture all the standard patterns of binding posts, we strongly recommend the use of the Novelty design.

#### PRICES.

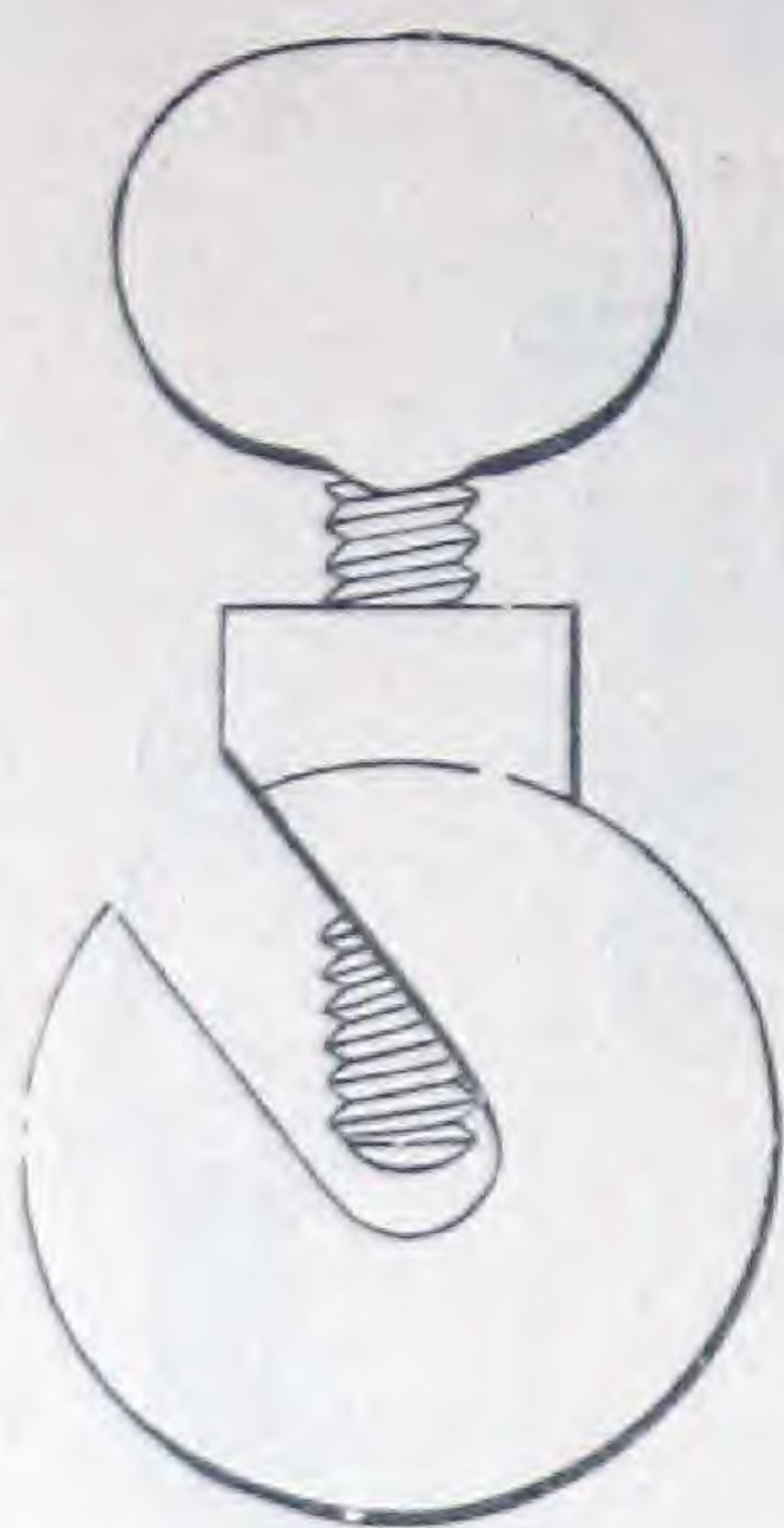
No. 500, Brass, each,	10 cts.	Per 100,		\$8.00
" 500, Nickel-plated, each,	12 "	" 100,		10.00
" 501, Brass,	" 12 "	" 100,		10.00
" 501, Nickel-plated,	" 14 "	" 100,		12.00







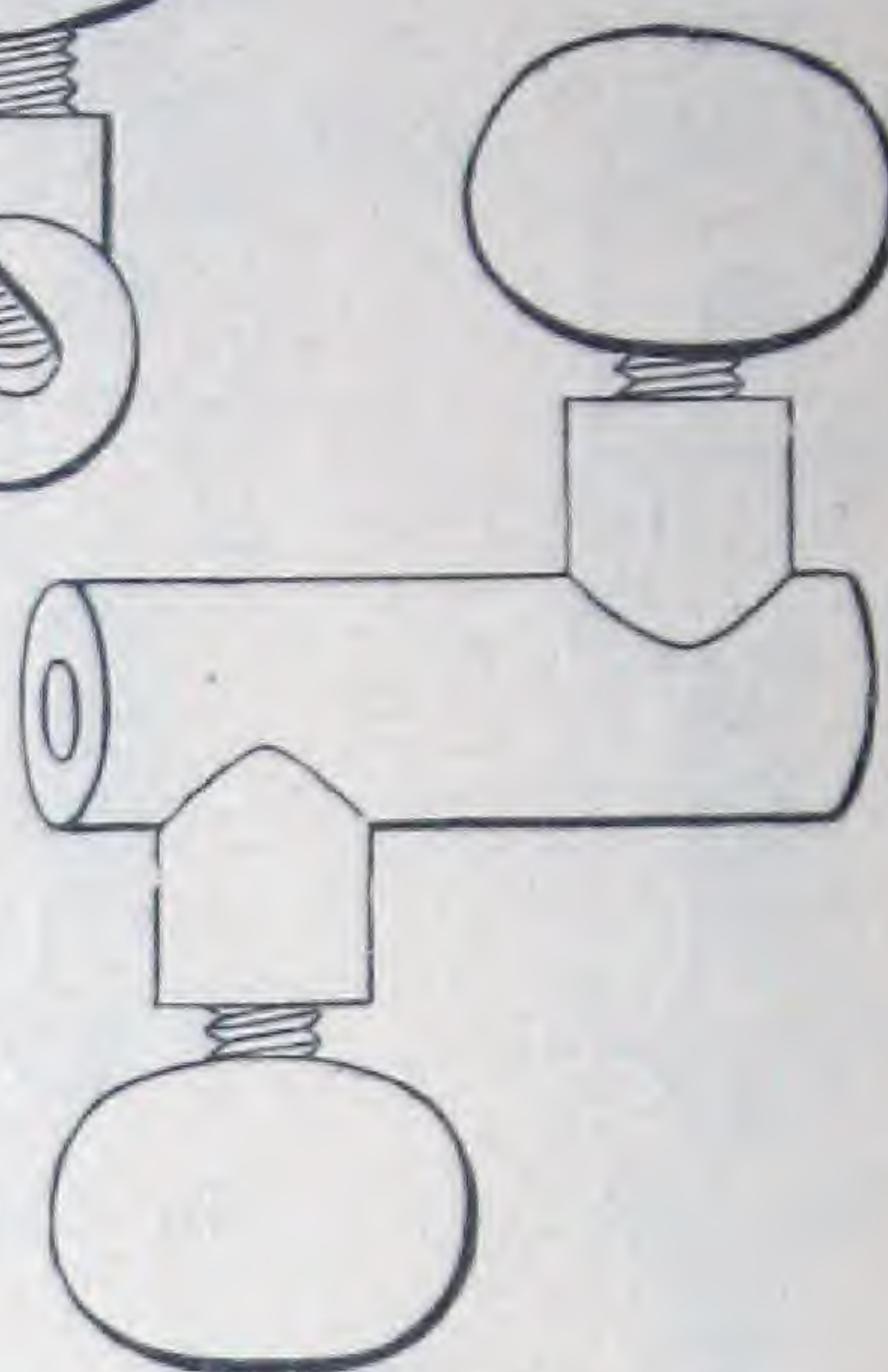
## WIRE CONNECTORS.



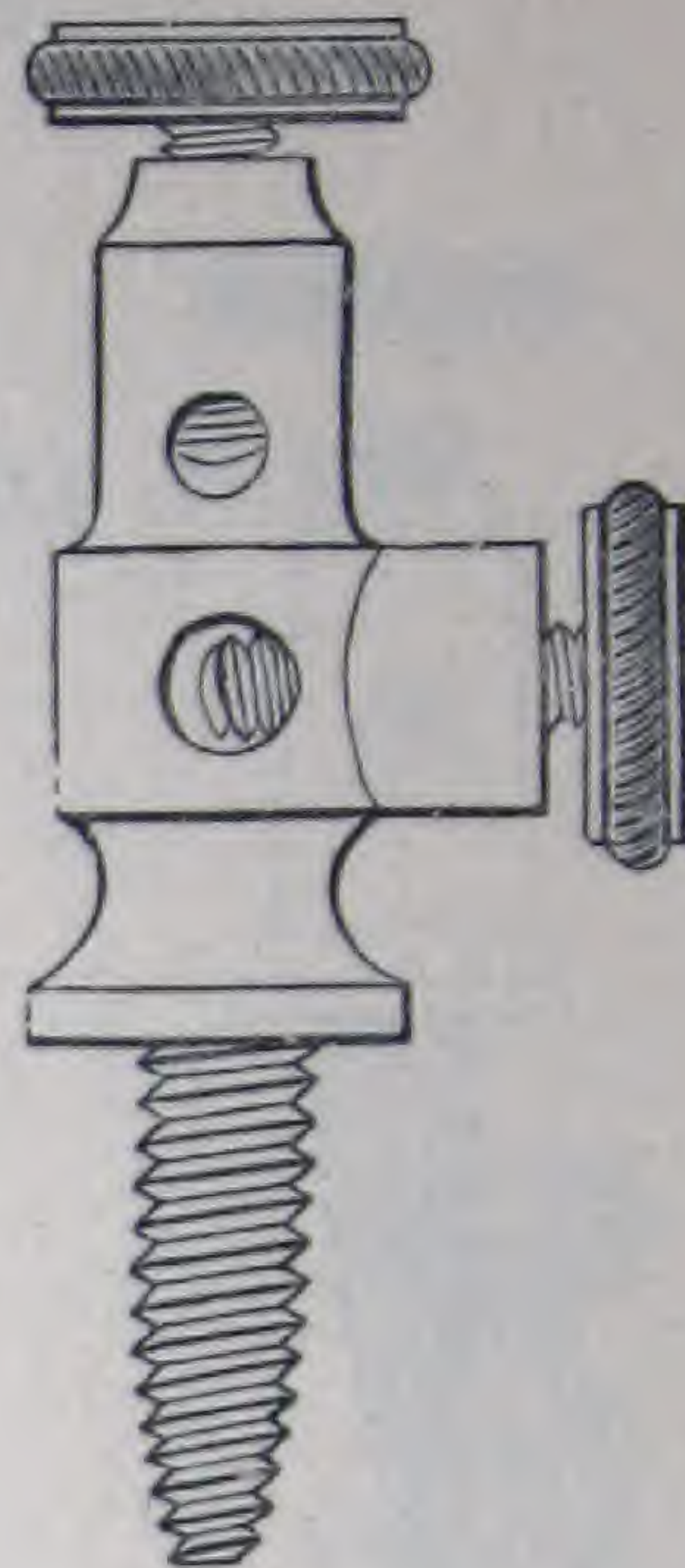
No. 511.



No. 512.



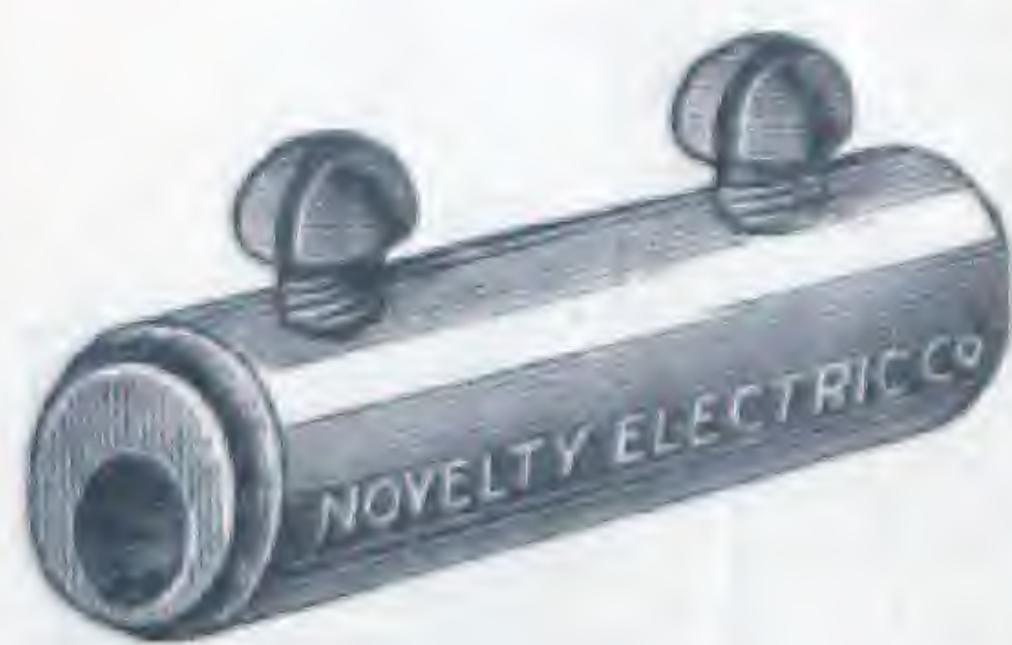
No. 513.



No. 514.

### PRICES.

	Each.	Per 100.
No. 511, Improved Connector, . . . . .	20 cts.	\$15.00
" 512, " " small, . . . . .	8 "	7.50
" 513, Plain Double Connector, . . . . .	10 "	9.00
" 514, Double Wood Screw Binding Post, . . . . .	15 "	12.00

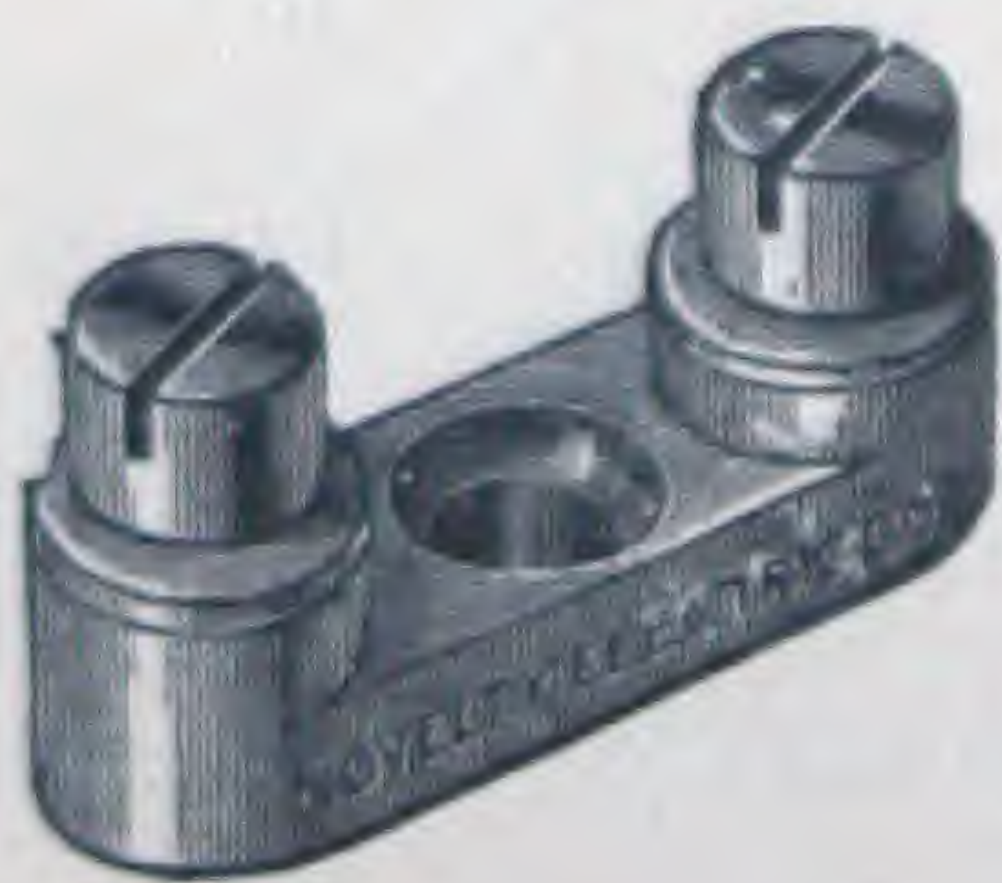


## ELECTRIC LIGHT WIRE CONNECTORS.

### OUR OWN DESIGN.

Strong wrought brass, with iron screws. In ordering give size of wire you wish to connect.

Size, 000, each. . . . .	25 cts.	Size, 3, each. . . . .	12 cts.
" 00, " . . . . .	20 "	" 4, " . . . . .	10 "
" 0, " . . . . .	15 "	" 8, " . . . . .	7 "
" 1, " . . . . .	14 "	" 12, " . . . . .	5 "
" 2, " . . . . .	13 "		



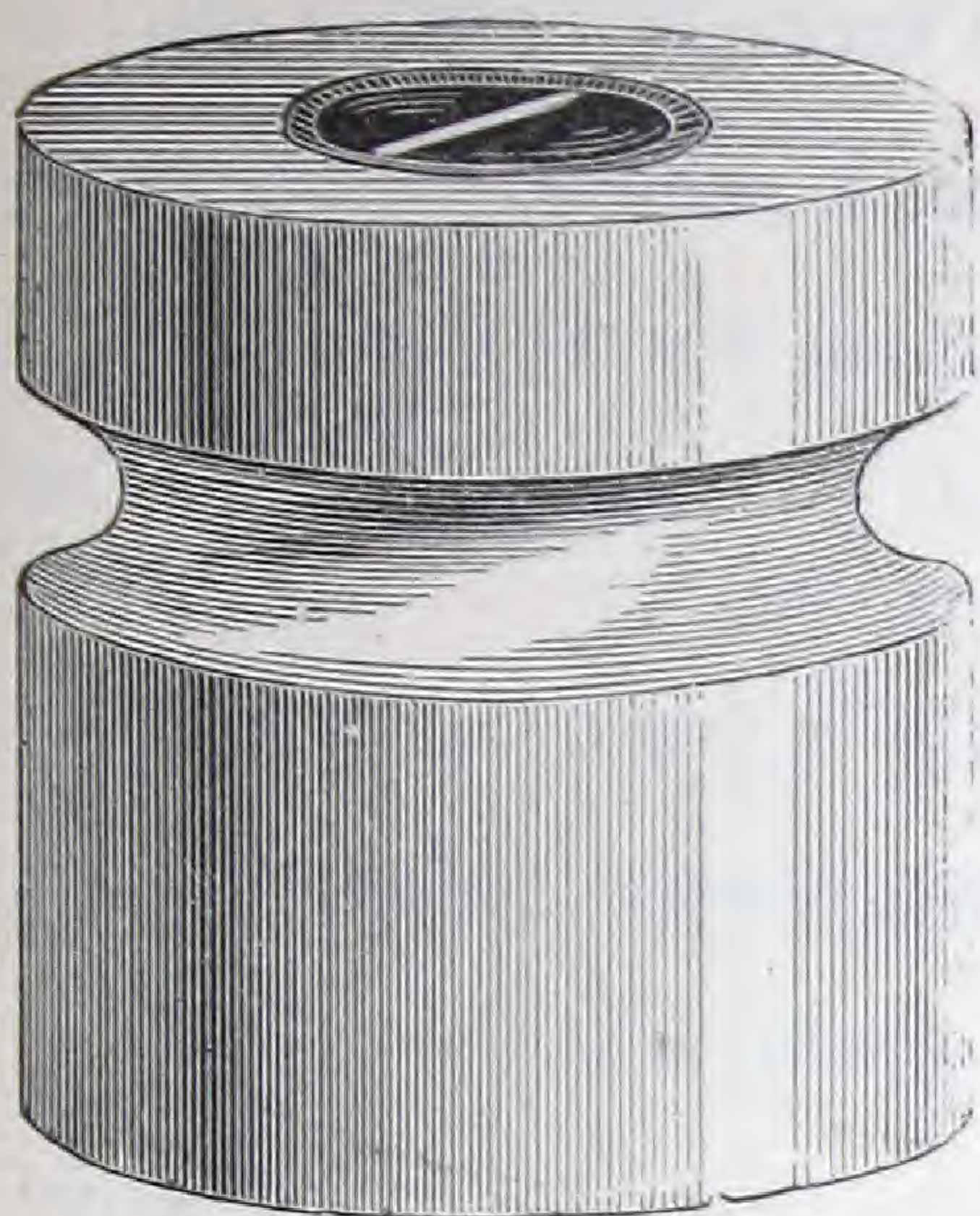
## DOUBLE BRASS CONNECTOR.

### NEW STYLE.

Price, each, . . . . .	\$ .12
" per 100, . . . . .	10.00



## PORCELAIN INSULATORS.



No. 5, Heavy.

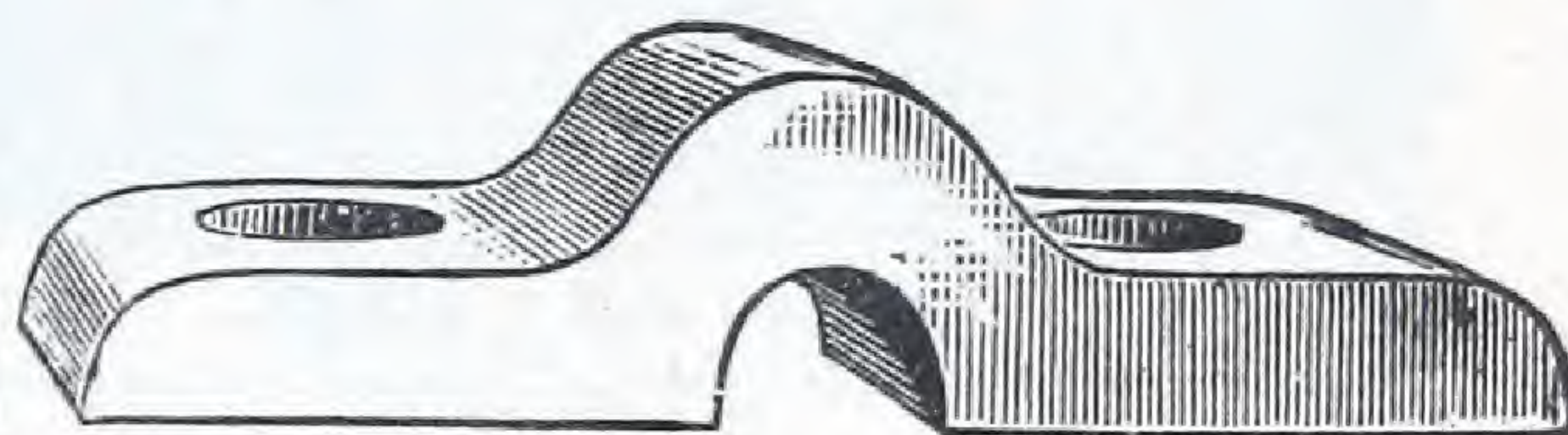
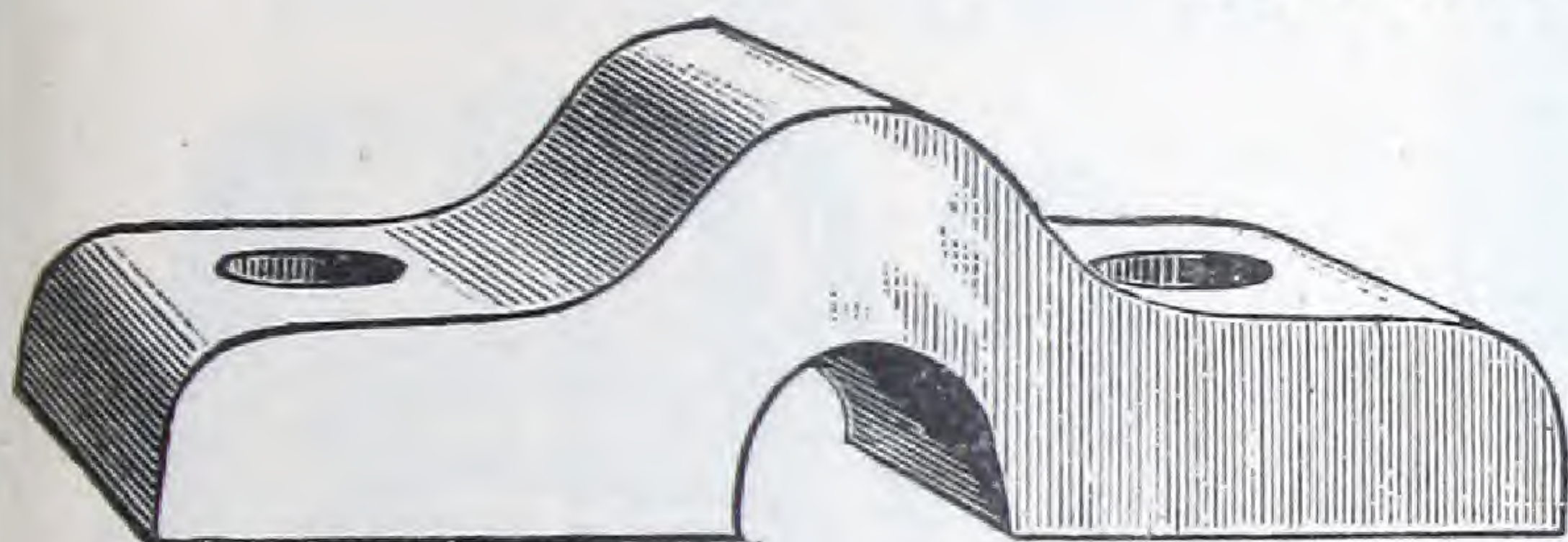
Price each, with screw,	\$ .05
“ “ without screw,	.03
“ per 1,000,	20.00

No. 4, Ordinary.

Price each, with screw,	\$ .03
“ “ without screw,	.02
“ per 1,000,	14.00

## PORCELAIN WIRE CLEATS.

CUTS FULL SIZE.



No. 3, Heavy Cleat, for Electric Light Wires.

Per 100, \$2.00 ; per 1,000, \$14.50.

No. 4, same as No. 3, but Lighter.

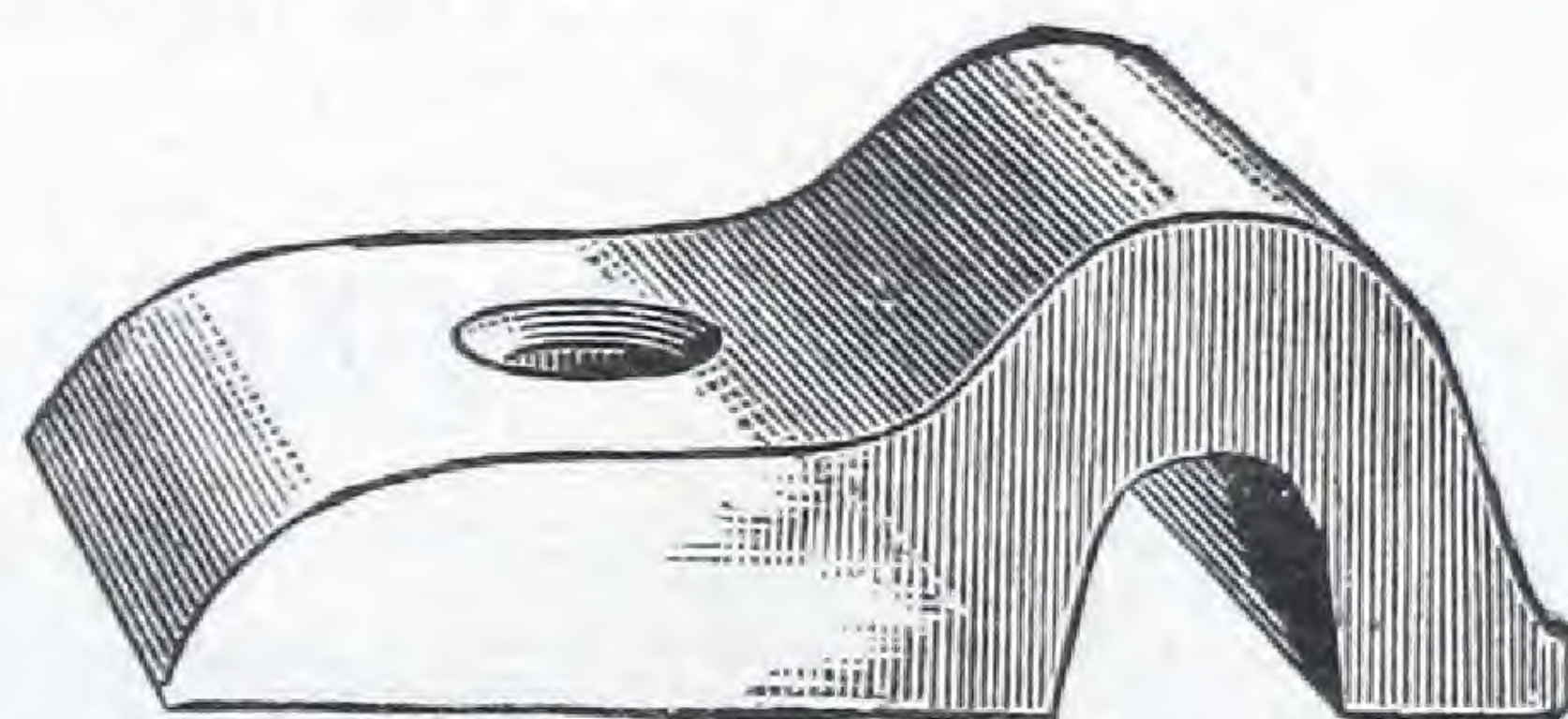
Per 100, \$2.00 ; per 1,000, \$14.50.

For Walnut Office Wire Cleats, see page 71.



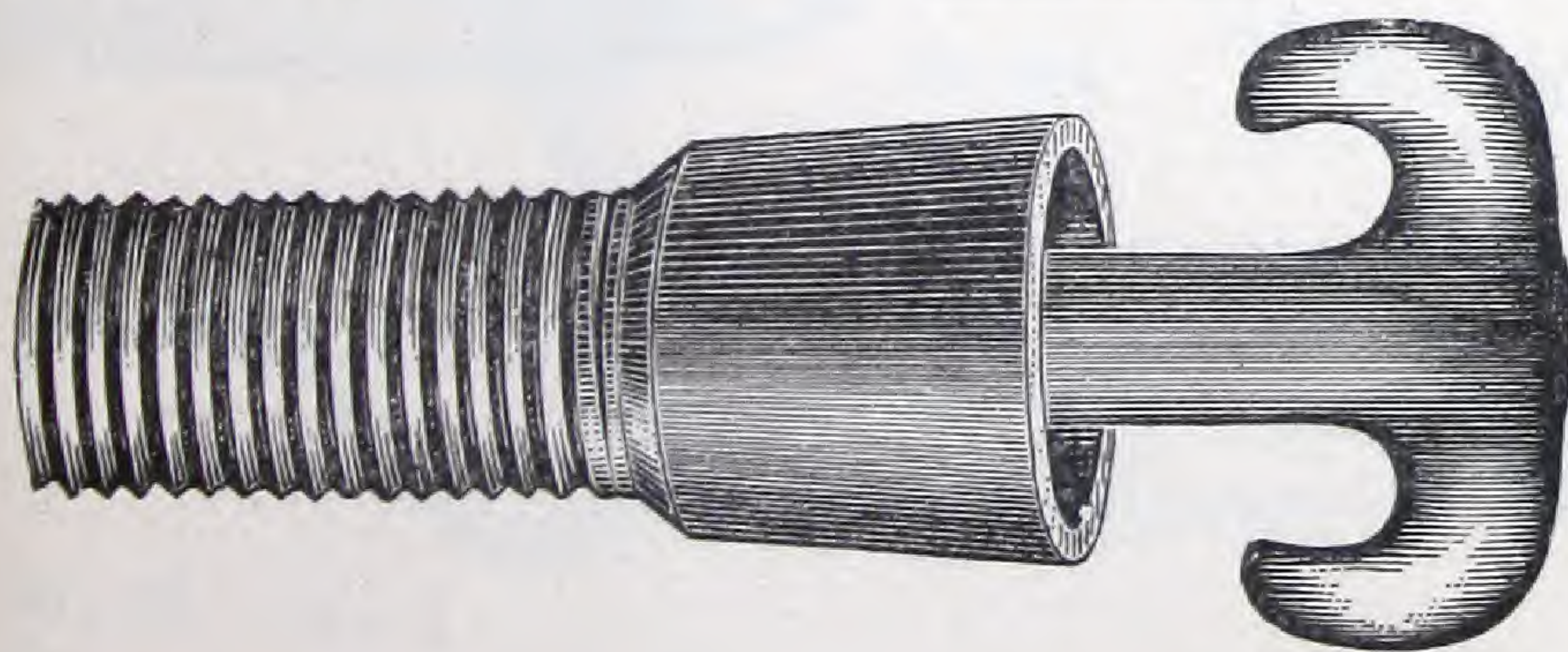
No. 1, Office Wire Cleat, 2 Wires.

Per 100, \$2.00 ; per 1,000, \$14.50.



No. 2, Electric Light Wire Cleat.

Per 100, \$1.50 ; per 1,000, \$10.00.

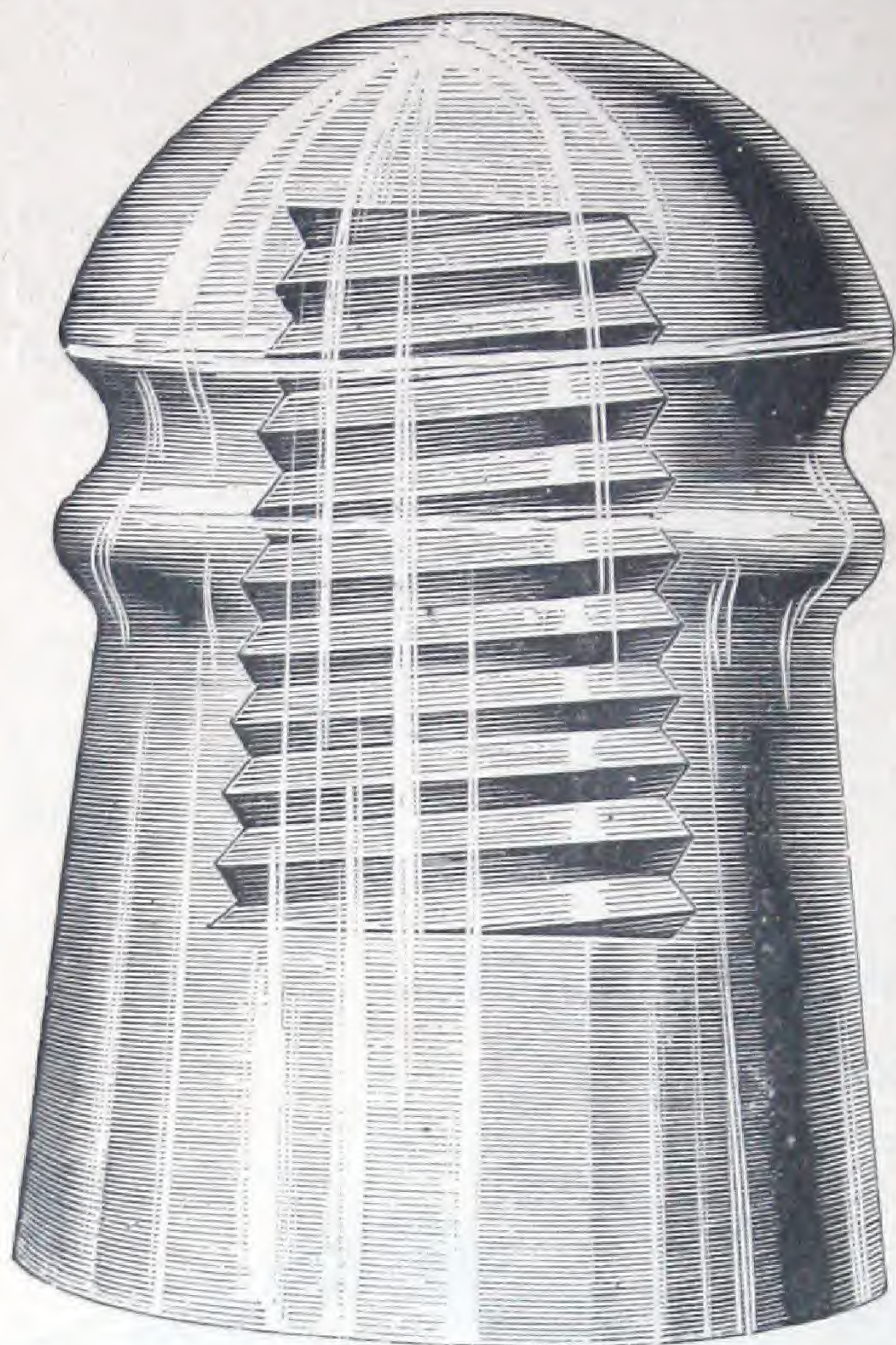


## RUBBER HOOK INSULATORS.

Price, each,	\$ .14
“ per 100,	13.00



## SCREW GLASS INSULATORS.

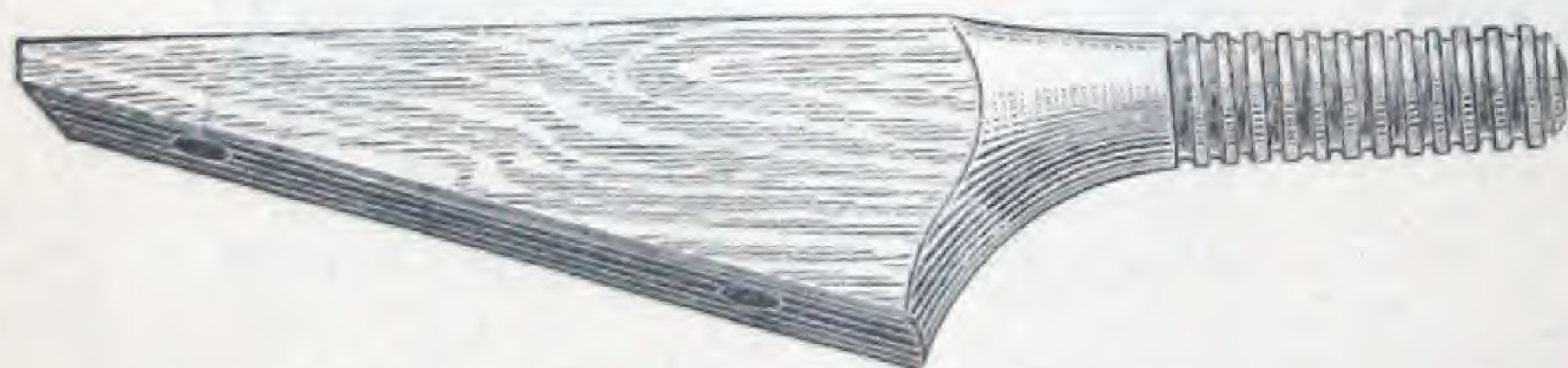


PONY, FULL SIZE.

### REGULAR PATTERN INSULATOR.

Price, each, . . . . .	\$ .04½
" per 1,000, . . . . .	40.00

### OAK BRACKETS.



Best quality, painted, price per 1,000, . . . . .	\$20.00
" " " " each, . . . . .	.03

### OAK PINS.



Best quality, per 1,000, . . . . .	\$15.00
" " each, . . . . .	.02

### Pony Screw Glass Insulators.

For telephone and private line wires.

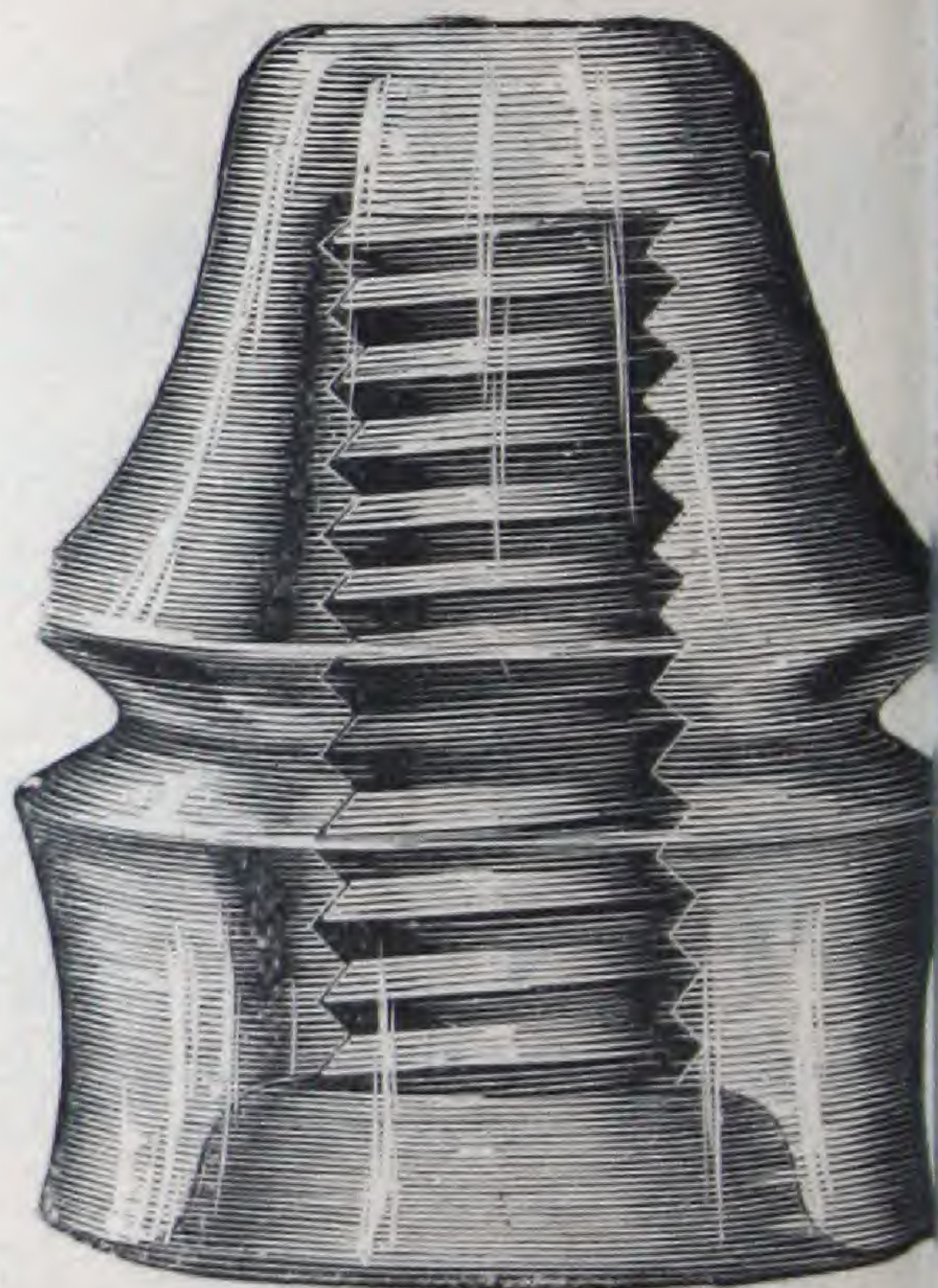
From Nos. 11 to 18.

Price, each, . . . . .	\$ .03
" per 1,000, . . . . .	25.00

### Deep Groove Insulators.

For electric light line wire.

Price, each, . . . . .	\$ .05
" per 1,000, . . . . .	45.00





## PORCELAIN OFFICE KNOBS.

### REGULAR PATTERN.

$\frac{3}{4}$ inch, without screws, per dozen,	20 cts.
1 " " " " " " " " " " " " " " " "	20 "
1 $\frac{1}{2}$ " " " " " " " " " " " " " " " "	50 "
$\frac{3}{4}$ " with " " " " " " " " " " " " " " " "	25 "
1 " " " " " " " " " " " " " " " "	25 "
1 $\frac{1}{2}$ " " " " " " " " " " " " " " " "	60 "

## FOR ELECTRIC LIGHT WIRE.

No. 7, $\frac{7}{8}$ inches diameter, without screws, per dozen,	20 cts.
" 11, 1 $\frac{1}{8}$ " " " " " " " " " " " " " " " "	25 "
" 12, 1 $\frac{3}{8}$ " " " " " " " " " " " " " " " "	30 "
" 7, $\frac{7}{8}$ " " " with " " " " " " " " " " " " " " " "	25 "
" 11, 1 $\frac{1}{8}$ " " " " " " " " " " " " " " " "	35 "
" 12, 1 $\frac{3}{8}$ " " " " " " " " " " " " " " " "	40 "

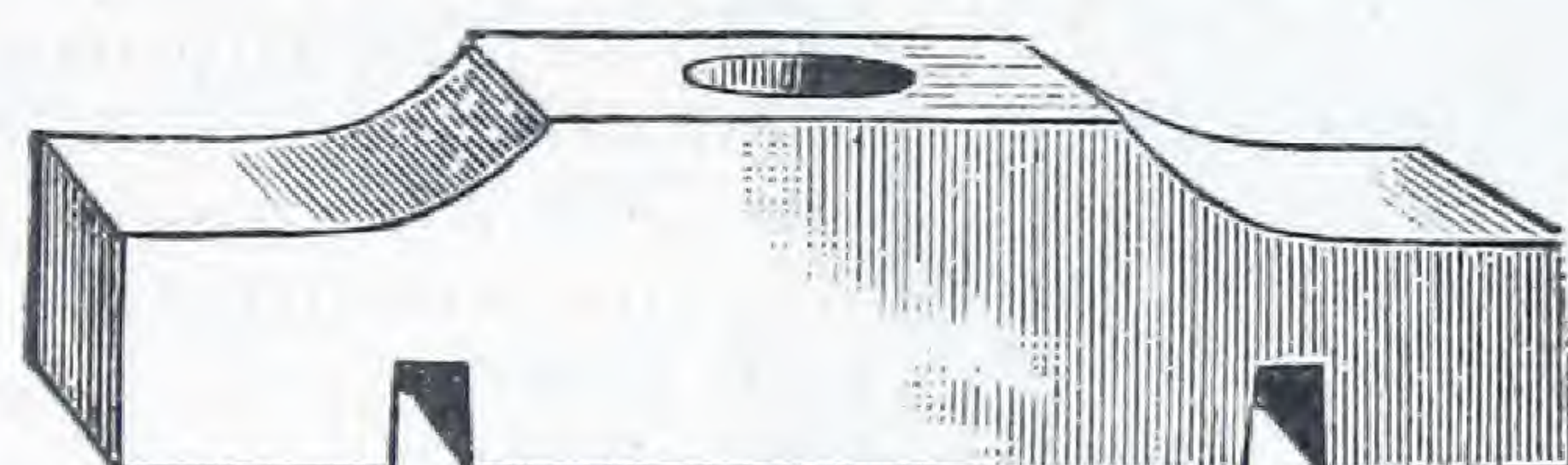
### OFFICE WIRE STAPLES.



No. 1. No. 2. No. 3.

Price per gross, . . . . . 12 cts.  
 " " lb., . . . . . 40 "  
 Special prices in large quantities.

### OFFICE WIRE CLEATS.



Black Walnut, for 2 to 20 Wires.

Price per wire, . . . . . 1  $\frac{1}{4}$  cts.

### MESSAGE HOOKS.

No. 1—Steel, Nickel-plated.

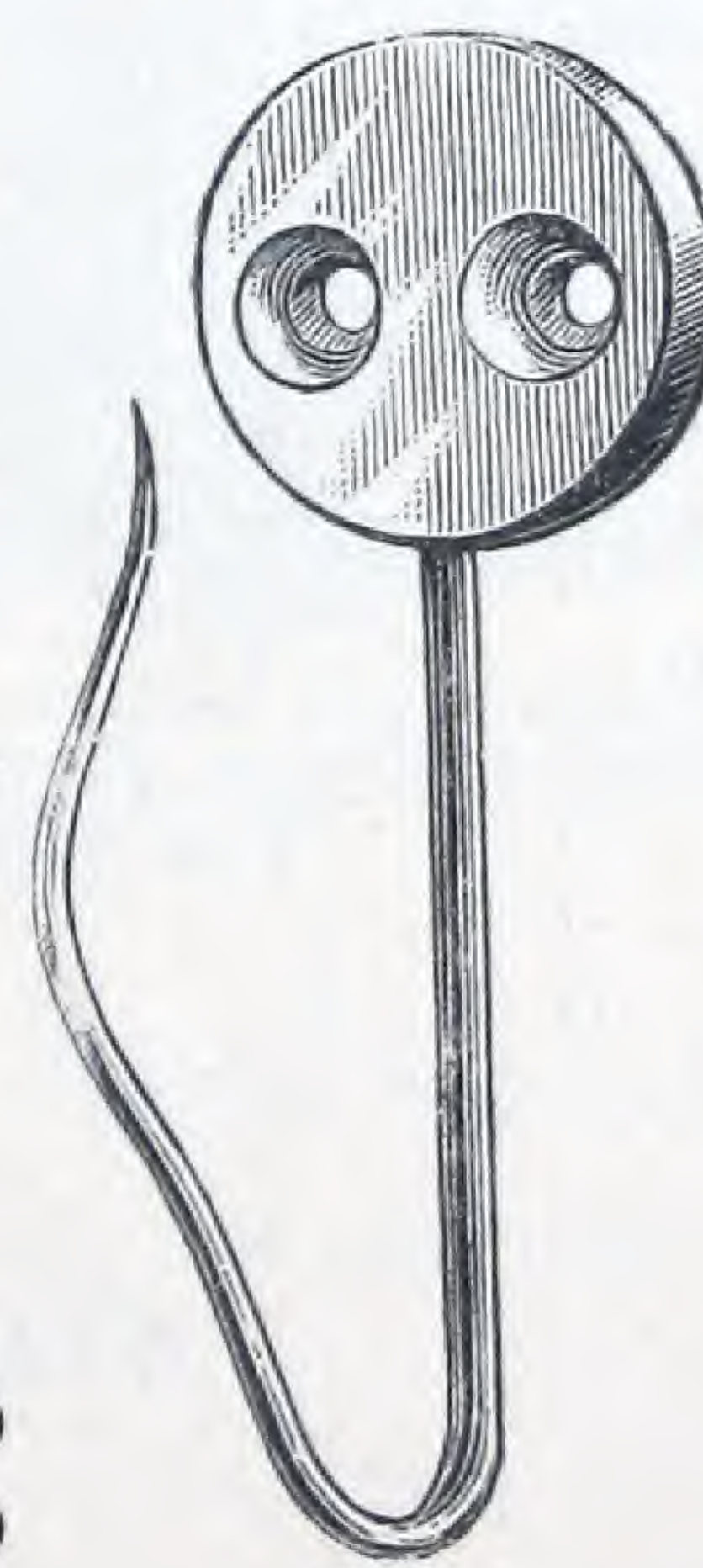
Price per doz., . . . . . 75 cts.  
 " " plain, . . . . . 60 "

No. 2—Nickel-plated.

Price per doz., . . . . . \$1.00  
 " " brass, . . . . . .80



No. 1.



No. 2.



## INSULATING MATERIAL.

### VULCANIZED FIBRE.

This material is made in sheets from 12 to 24 inches wide, by about 50 inches long, and from  $\frac{1}{32}$  to  $\frac{3}{4}$  inch thick. It is entirely free from grit, is very hard and dense, and at the same time exceedingly tough and elastic under compression, and is not in the slightest degree deteriorated by age, but, on the contrary, improves by seasoning. It can be worked in a lathe, drilled, riveted, sawed and stamped; can be fitted with sharp, strong screw threads, and receives a fine polish. It is not brittle, and cannot be fractured by a fall, or any ordinary blow. It is an EXCELLENT INSULATOR in all dry positions, and is largely used as a substitute for hard rubber by most of the principal ELECTRIC LIGHT COMPANIES and MANUFACTURERS OF ELECTRICAL INSTRUMENTS in the United States.

Price, per lb., . . . . . \$1.00

### MISCELLANEOUS.

Watch Oil for Registers, per bottle.....	\$ .25
Watch Oil Can, nickel-plated, for pocket.....	.75
Lacquer, per bottle, $\frac{1}{4}$ pint, 40 cts.; $\frac{1}{2}$ pint, 70 cts.; 1 pint, \$1.25; one quart, 2.50	
Adjustment Screws.....	.10
"    "    Check Nuts.....	.10
Trunnion Screws.....	.12
"    "    Check Nuts.....	.10
Key Lever Knobs.....	.20
"    "    "    with Dowels.....	.25
"    "    "    Soft Rubber.....	.75
Circuit Closer Knobs.....	.08
"    "    "    with Dowels.....	.10
Top Screws for Binding Posts.....	.08
Iron "    "    "    ".....	.01
Brass Washers.....	.02
Instrument Springs, each.....	.10
"    "    per dozen.....	.60
Hard Rubber, in sheets, per lb.....	1.75
"    "    in rods, per lb.....	2.00
Tin Foil (pure imported), for Condensers, sheets 12x24 inches, per sheet.....	.10
"    per dozen sheets.....	.75
"    per package of 36 sheets.....	1.00
"    common, per lb.....	.50
Magnesium Lamps.....	\$15.00 and 25.00
French Emery Paper, No. 1, No. 0, No. 00, No. 000, per sheet.....	.04
"    "    "    "    per 100 sheets.....	3.00
"    "    "    No. 0000, per sheet.....	.05
"    "    "    per 100 sheets.....	4.00

### STANDARD LUBRICANT FOR DYNAMOS.

Price per lb., in 10 lb. cans..... .25



## ELECTRIC BELLS.



### NOVELTY WOODEN BOX BELL.

Nickel-plated, with finely polished black walnut case.

#### PRICES :

2½ inch Gong,	\$2.00
3    "    "	2.25
3½    "    "	2.50
4    "    "	2.75

### NOVELTY CLOSED CIRCUIT BELL.

For use with our Closed Circuit System of

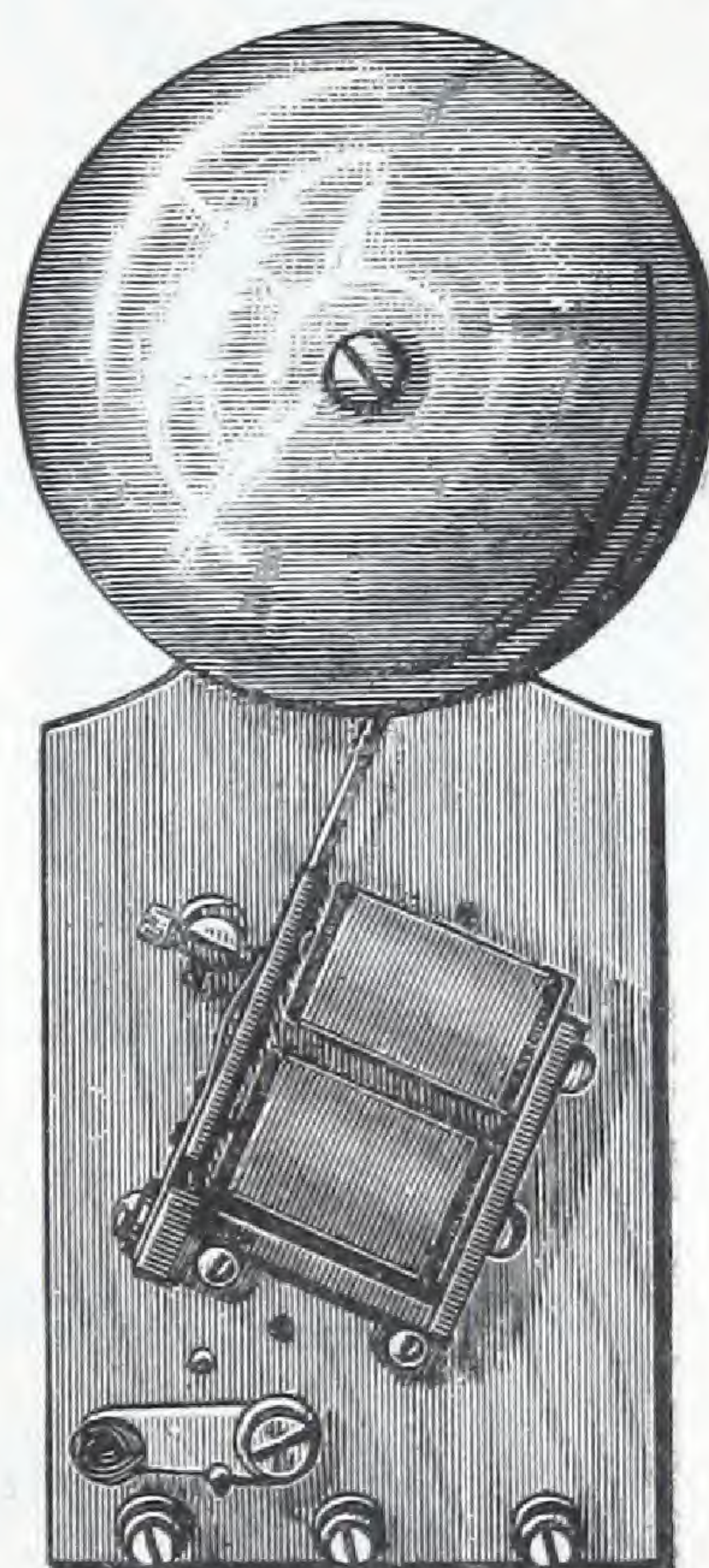
**BURGLAR ALARM,**

FOR PROTECTION OF

Barns, Stables, Chicken Houses, &c.

Has 4 inch nickel-plated gong, with switch for cutting out bell when not in use.

Price, each, . . . . . \$2.75



### CONTINUOUS RINGING ATTACHMENT.

For closing a Bell Circuit automatically, and holding it closed as long as desired, can be furnished in connection with any of our Box Bells, and are valuable in connection with Burglar Alarms.

Price, . . . . . \$2.00



## MONITOR CALL BELL.



This is a new and improved Vibrating Bell. Can be set on a table or bracket, or hung on the wall.

Bell nickel-plated. Base of polished  
black walnut.

Price, 2½ inch Bell,	.	.	.	.	.	.	\$1.75
" 3 "	"	"	.	.	.	.	2.00
" 3½ "	"	"	.	.	.	.	2.25
" 4 "	"	"	.	.	.	.	3.00

## TURTLE GONGS.

Metal base, works entirely concealed. When hung upon the wall, shows nothing but the nickel-plated gong. A splendid article.

Price, 4 inch Gong,		\$2.50
" 6 "		6.50
" 8 "		10.50
" 10 "		12.50

IMPROVED GRAVITY OR  
TELEPHONE BELL.

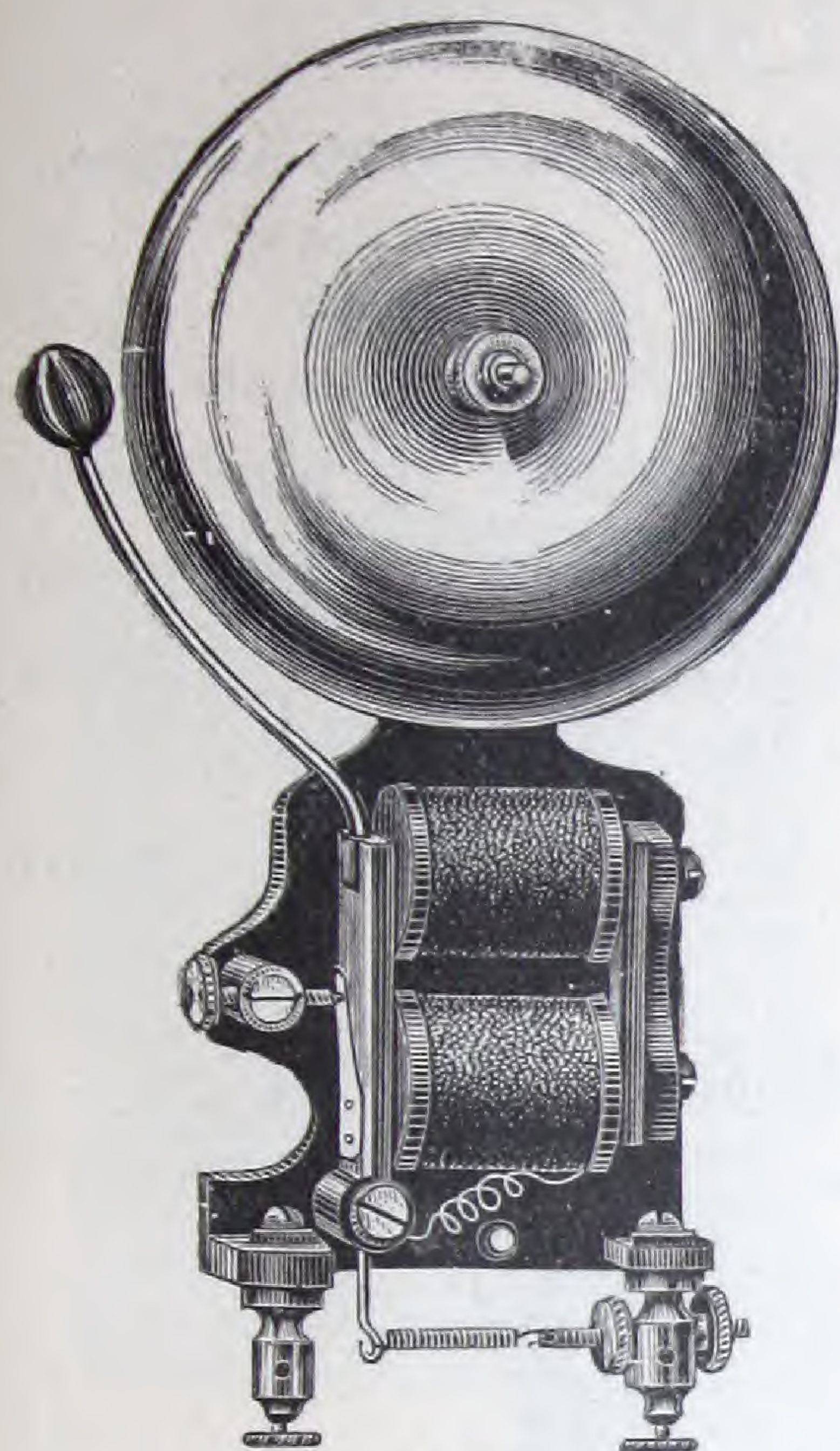
With back base and binding posts, 25 ohms resistance, for 15 mile line.

Price,	\$3.00
" without back base,	2.50
" 5 ohms, for short wires,	2.50





## Iron Frame Skeleton Electric Bell.

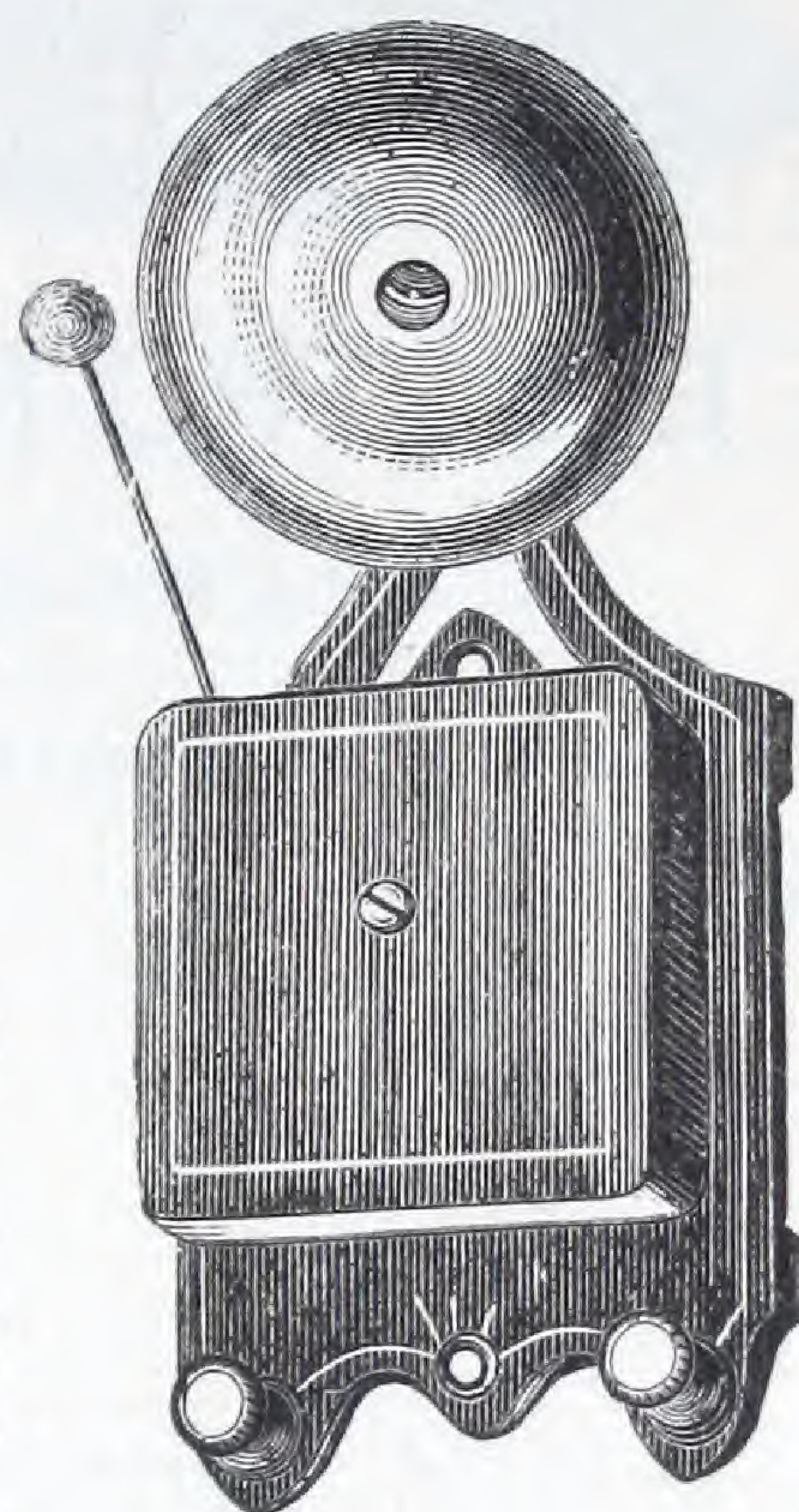


4 inch, single stroke or vibrating,	\$4.00
5 " " " " " "	4.25
6 " " " " " "	5.25
7 " " " " " "	5.75
8 " " " " " "	7.50
10 " " " " " "	15.00
12 " " " " " "	20.00

### ENAMELED METAL BOX BELL.

Fine finish, nickel-plated, strong, reliable, and very handsome in appearance.

Price, 2½ inch Gong,	\$1.75
" 3 " " " "	2.00
" 3½ " " " "	2.50
" 4 " " " "	3.00



### THE PORTABLE CALL BELL,

Of our own Design and Manufacture, for the use of Invalids, or for any purpose where an Electric Bell is required.

Handsomely enclosed in Finished Walnut Box.

With this apparatus the invalid can summon the attendant by the slightest movement of the hand. It can be set up and put in operation in any room in a few minutes. The push button should be placed on the couch beside the invalid. The battery and bell placed in the room occupied by the attendant, and the conducting cord suspended in a convenient location.

Price for Bell, Battery, Pear-shaped Push Button, with 25 feet conducting cord, \$7.50

Extra Cord, per yard, .25



## ELECTRICAL BUZZER.



Nickel-plated, with Fine Walnut Base.

The Buzzer is used where the sound of a bell is annoying and unnecessary. The vibrating hammer strikes a sounding piece, producing a quiet buzzing sound, used as a chief clerk or messenger call.

Price, . . . . . \$2.00

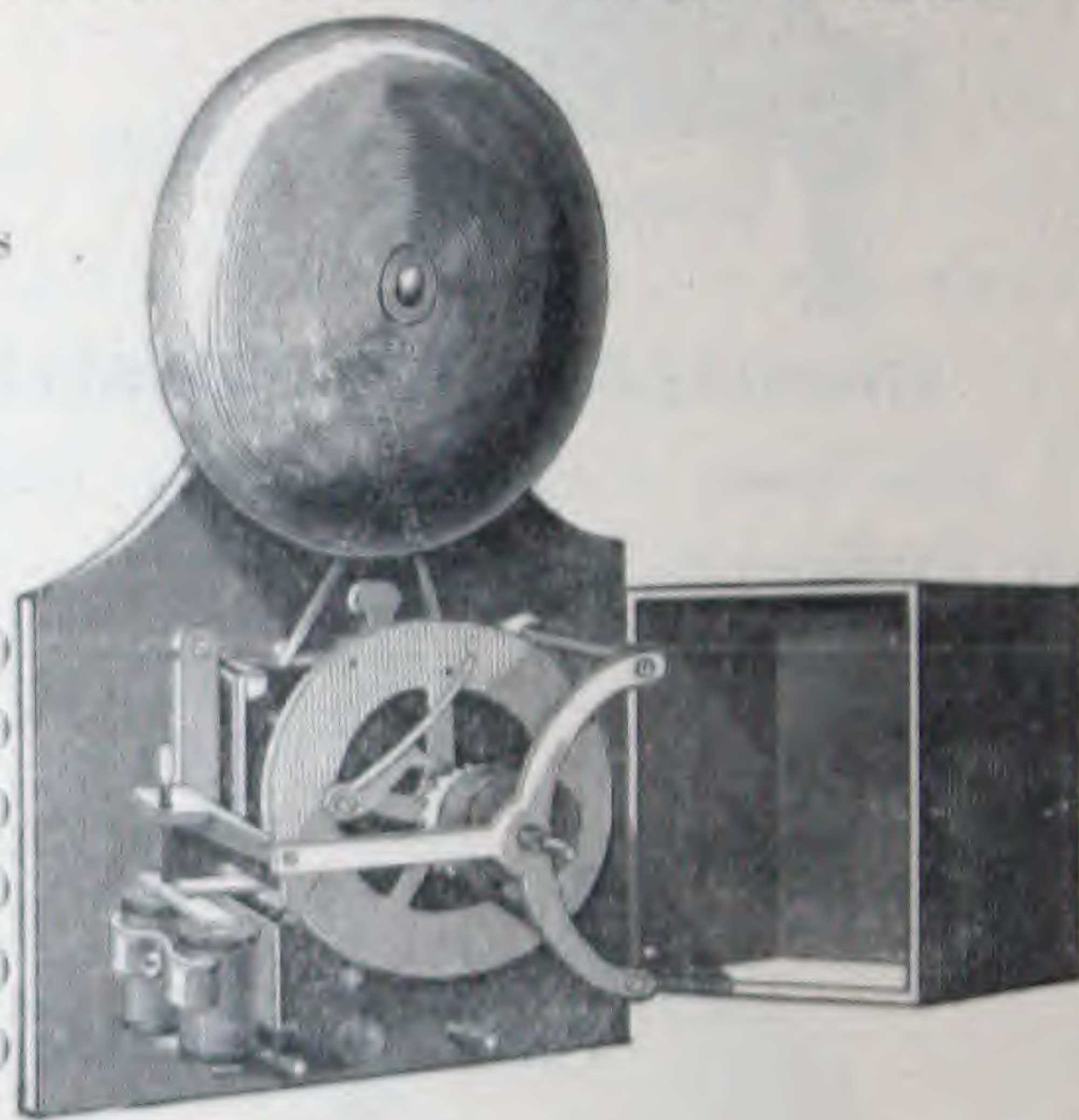
## ELECTRO-MECHANICAL GONGS.

With Spring Movement.

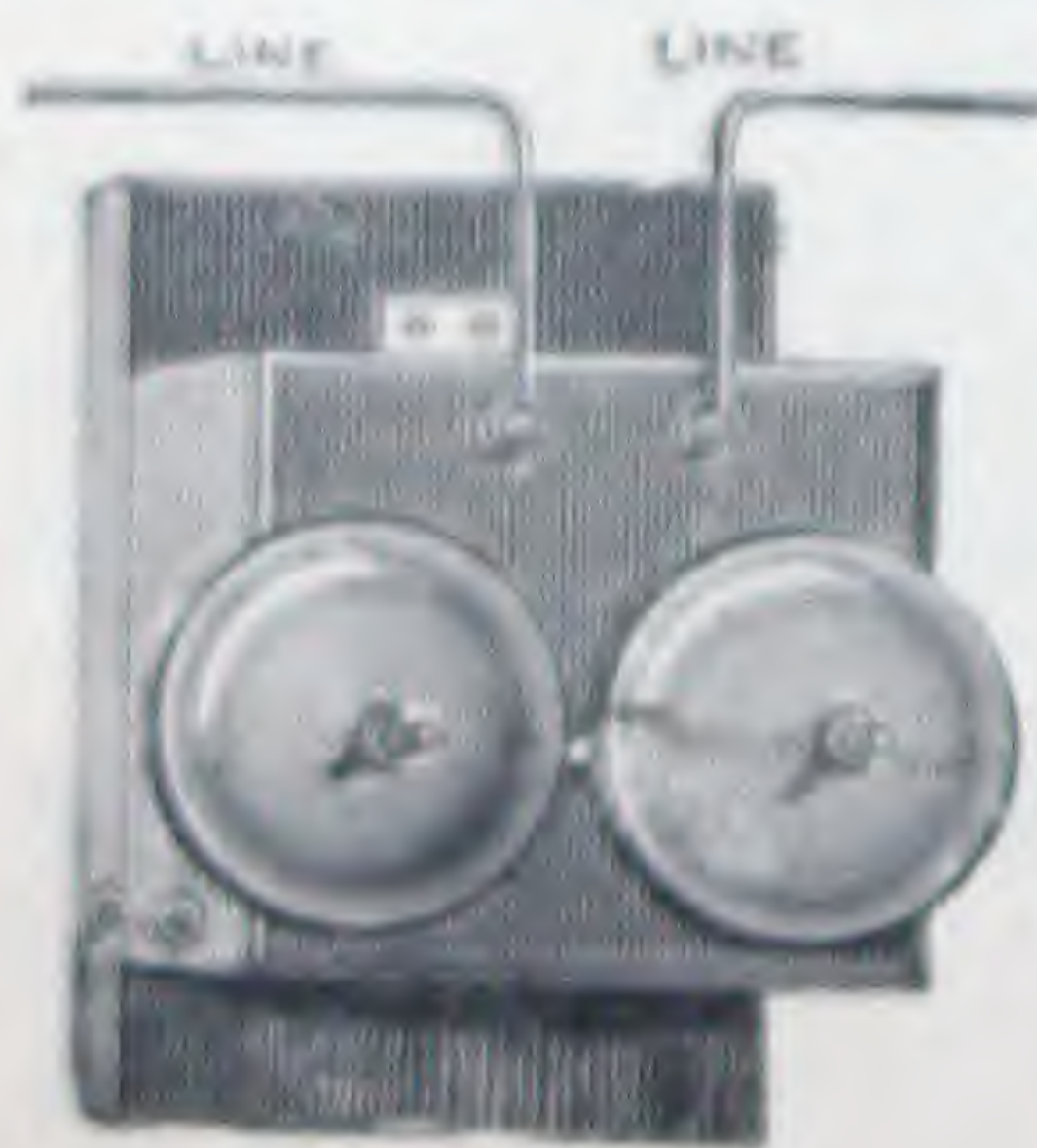
Gives a very powerful blow, and is perfectly reliable.

### PRICES.

8 inch Gong,	\$21.00
10 " "	24.00
12 " "	29.00
14 " "	39.00
15 " "	43.00
18 " "	50.00



## AUXILIARY MAGNETO CALL OR EXTENSION BELL.



Can be placed in any position, and is useful in calling attention to telephone signals, when the office is for the time left vacant. It is placed directly on the main line, and is provided with lightning arrester and cut-out.

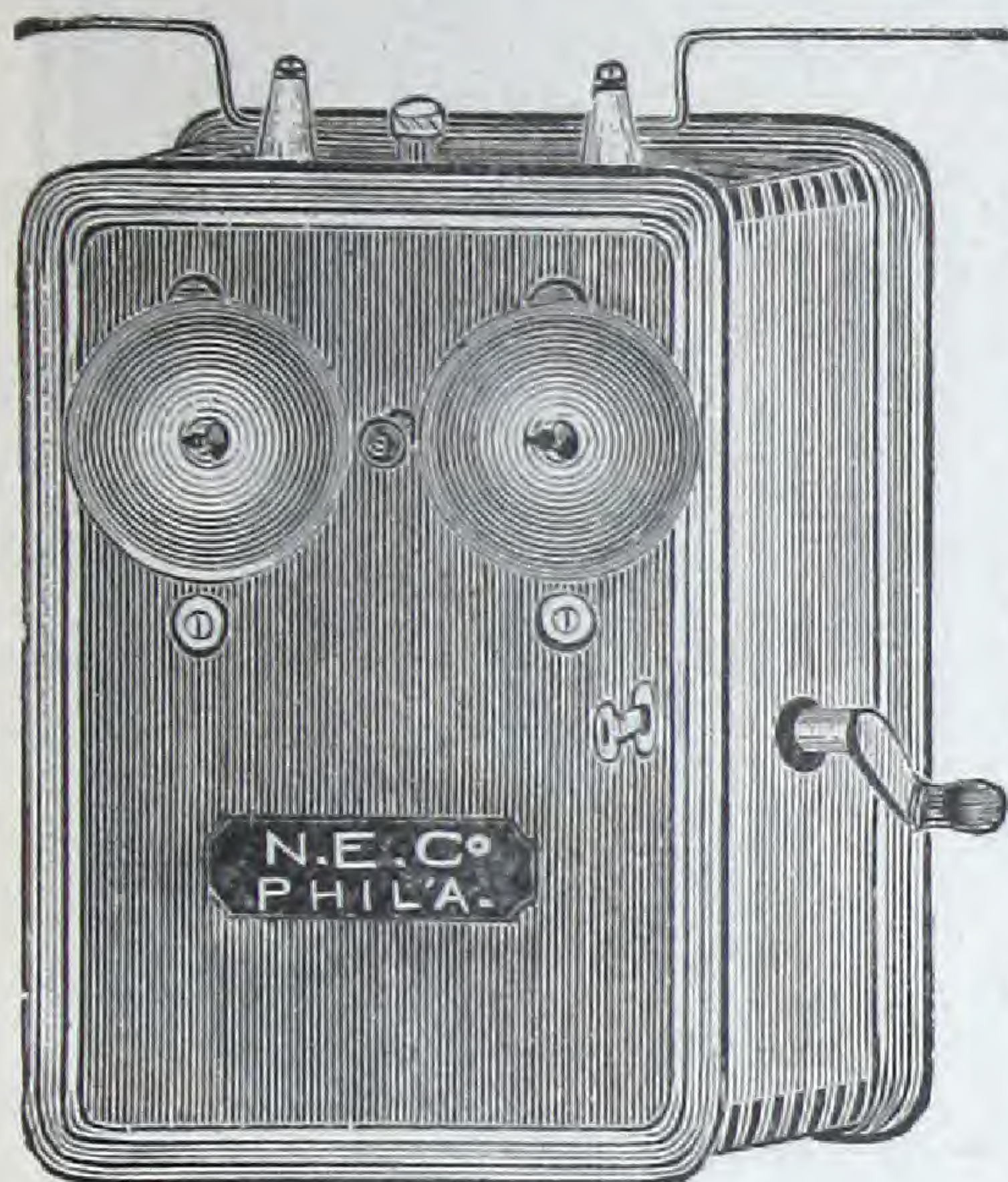
We have them fitted with sheep- or sleigh-bells for use where different sounds are required.

Price, each,	\$3.00
" " sheep-bells,	3.50
" " sleigh " "	3.50



## MAGNETO CALL BELLS.

### STANDARD PATTERN SILK-WOUND MAGNETS.



Used on telephone lines in calling from one point to another.

#### NO BATTERY IS REQUIRED.

Available and extremely convenient for use in many situations where it is impracticable to use batteries. It is reliable in every respect, and has a resistance sufficient to ring through eight to ten thousand ohms.

It will work on a line of almost any length required, and gives perfect satisfaction.

Price each, . . . . . \$6.00

### PONY PATTERN.

Intended for use on shorter lines than the "Standard" Bell. It is similar in construction, except that it is wound to a resistance sufficient to ring through two thousand ohms.

On lines of only a few miles in length, it will answer fully the purpose of signaling.

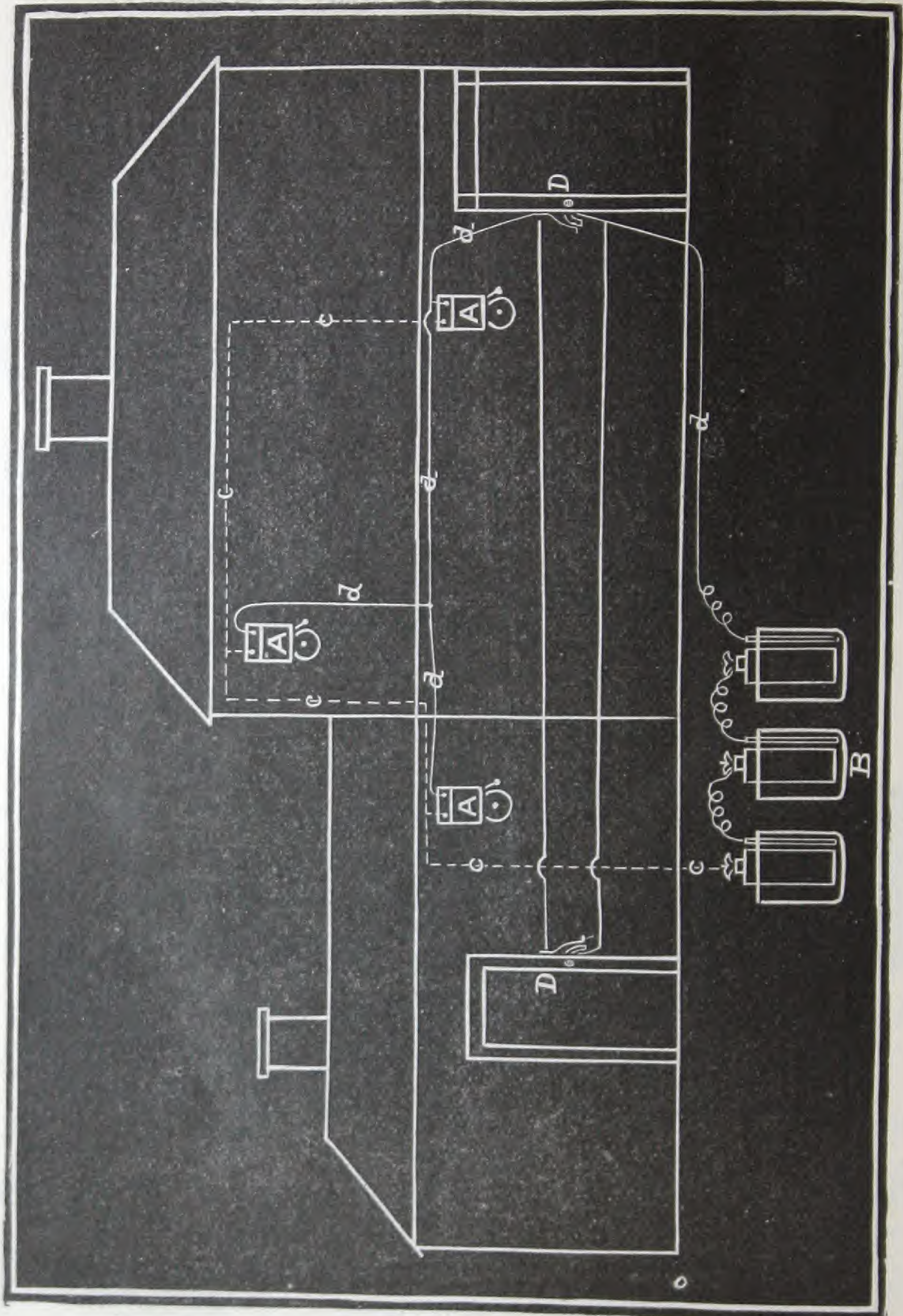
Price, . . . . . \$5.00

These bells are used by many persons in place of the telephone. They do not require any battery, and the cost being comparatively small, the demand for them has greatly increased during the past year.



## DIAGRAM OF CONNECTIONS.

For one or more bell pulls or push buttons, one or more vibrator bells, and one battery, for private houses, hotels, manufactories, and public buildings.



This system can be used indefinitely for a *danger signal* in hotels, factories or other buildings. In case of fire in a hotel every guest can be awakened instantly by simply pushing a button in the hotel office. Schools can be dismissed from the principal room, each and every department getting the signal at the same instant. The stopping time of factories can be timed to a nicety by this system from the General Superintendent's office.

We are prepared to furnish this system, with diagrams complete, or are prepared to make estimates and complete contracts for the work.



## ESTIMATES.

For the information of those who contemplate the erection of call bells, burglar alarms, annunciators, etc., and desire to arrive at an approximate estimate of their cost, we submit below a few illustrations of the cost of work of this class in some of our ordinary contracts.

### HOTEL ANNUNCIATOR FOR 50 ROOMS.

Annunciator and Bells at \$1.75,	\$87.50
50 Push Buttons,	12.50
4 cells Leclanche Battery,	4.00
Battery Box,	1.50
Wire, Labor, etc.,	75.00
	<hr/>
	\$180.50

### OFFICE, STORE AND FACTORY CALL BELL SYSTEM.

8 Bells at \$3.00,	\$24.00
5 Push Buttons,	1.25
4 cells Battery,	4.00
Battery Box,	1.50
Wire, Labor, etc.,	30.00
	<hr/>
	\$60.75

### HOUSE BURGLAR ALARM.

8 Indications, with Bells and Switches,	\$30.00
16 Window Springs,	4.00
2 Door " "	.50
4 cells Battery,	4.00
Battery Box,	1.50
Yale Lock Switch,	3.00
Labor, Wire, etc.,	40.00
	<hr/>
	\$83.00

### HOUSE ANNUNCIATOR, 10 ROOMS.

Drop or Needle, with Bell,	\$25.00
9 Push Buttons,	2.25
1 Door Pull,	2.50
4 Cells Battery,	4.00
Battery Box,	1.50
Wire, Labor, etc.,	30.00
	<hr/>
	\$65.25



## Electric Thermostat for Automatic Fire Alarms.



The Electric Thermostat is for use in automatic fire alarm systems, for signaling the rise in temperature wherever they may be placed, through an electric circuit and alarm bell.

The Thermostats are placed in the ceilings, one in every room or closet, in hotels, office buildings and dwelling houses. In all large rooms, such as stores, warehouses, and manufacturing establishments, one is placed in every 20 feet, so that in no case can the heat spread over ten feet before its effects will be felt.

When the atmosphere around any Thermostat in the building is overheated, the electric circuit is completed at that point, *the Bell rings to draw attention to the fire, and the Annunciator shows where it is.*

The contact points are of platinum, which makes them more durable and less liable to damage by oxidation than the old style Thermostats, where the contact is made by mercury and platinum. These Thermostats are adjustable to any degree of heat, but, when not otherwise ordered, are set at 125° Fahrenheit.

The great value of a thoroughly reliable Thermostat is so well known that it is unnecessary to detail its uses here. Our Electric Thermostats are encased in metal, nickel-plated, thus being perfectly protected, and are not liable to be broken or to get out of order.

Price, each, . . . . . \$1.50

## Electro-Thermic Cut-Off.

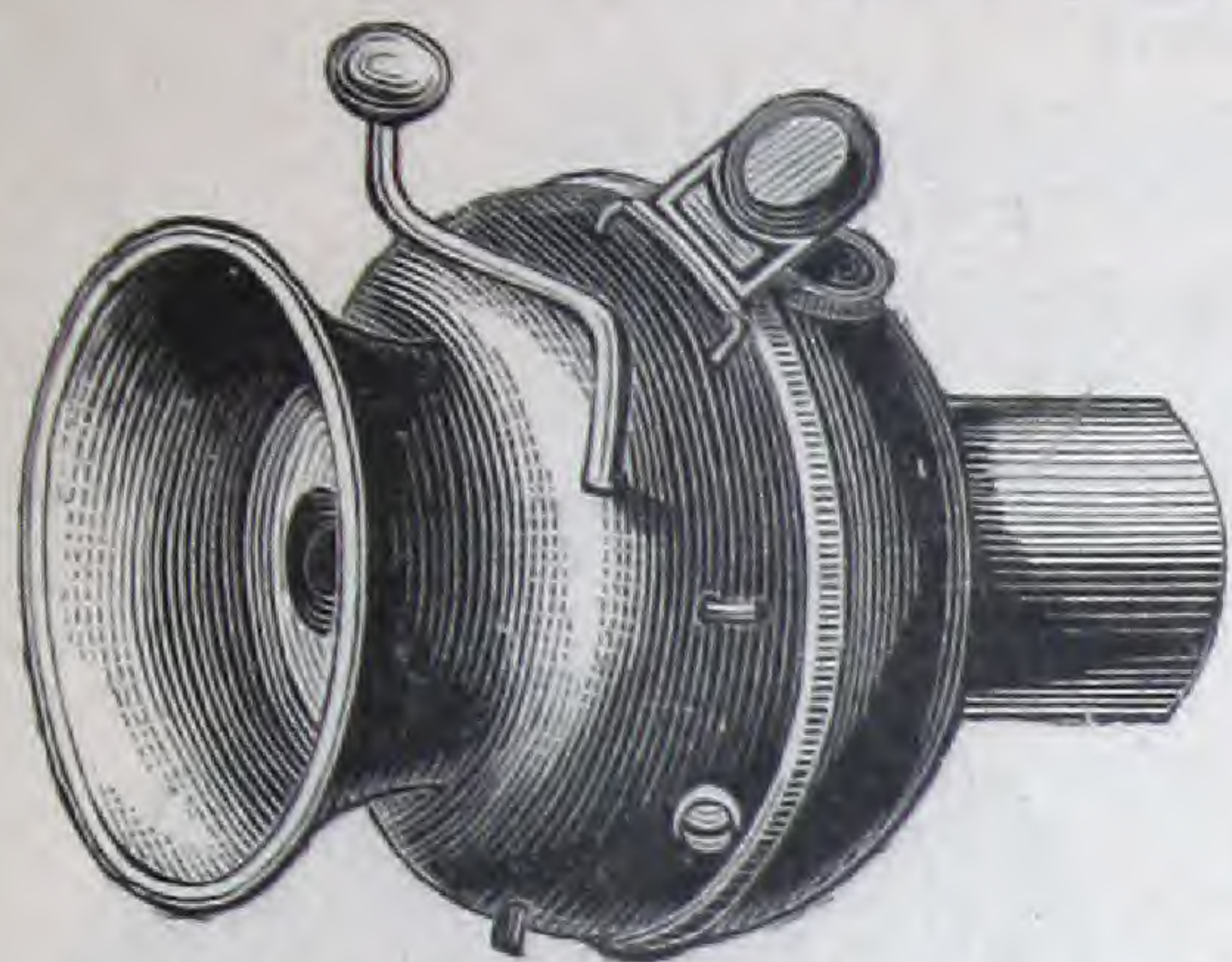
For Burglar Alarm, Call Bell, Annunciator, and other Open Circuit Systems.

It is entirely automatic, contains no magnets, clock-work, or other mechanical gearing. It is endorsed by electricians. Its object is to provide means whereby batteries in use may be protected from waste by accidental or other long-continued closing of the circuit. It can be used in combination with any open circuit battery, and so adjusted as to operate in from three to forty seconds, as desired.

Price, . . . . . \$10.00

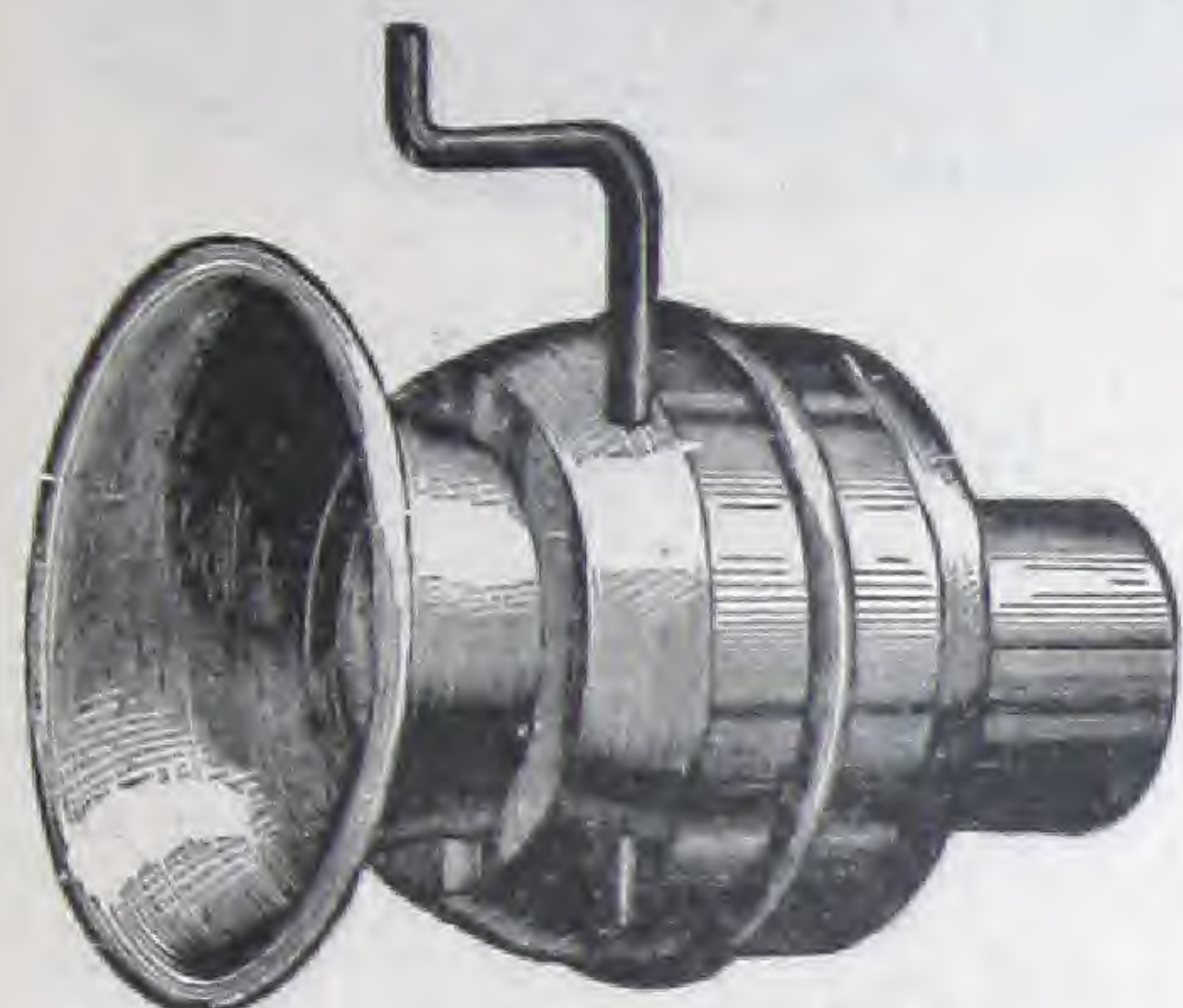


## SPEAKING-TUBE WHISTLES.



The indicator is used where there is more than one tube in a room, and designates the proper tube to answer.

Price, nickel-plated, per dozen,	\$12.50
“ Brass “	12.00



### SPEAKING-TUBE WHISTLE, WITHOUT INDICATOR.

Price, nickel-plated, per dozen,	\$11.50
“ Brass, “	11.00

### ROUND WHISTLE, SPRING OUTSIDE.

Made of Tin, with Porcelain Mouth-pieces.

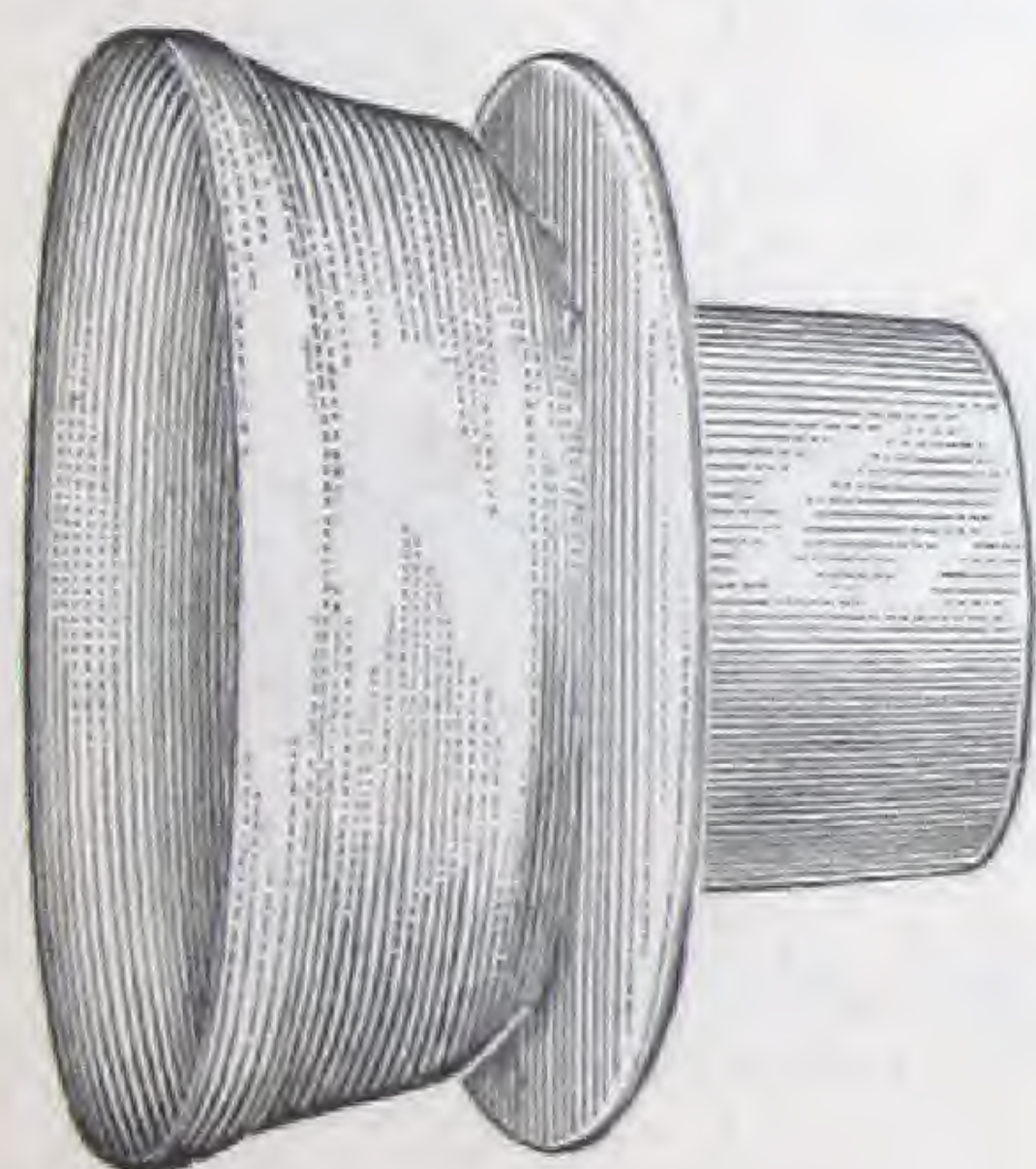
Price, with Indicator, per dozen,	\$7.25
“ without “	7.00

### ROUND WHISTLE, SPRING INSIDE.

Price, without Indicator, per dozen,	\$3.50
“ with “	3.75

### PARLOR WHISTLES.

Nickel-plated, with Indicator, per dozen,	\$9.50
“ “ without “	8.00



### OVAL PORCELAIN MOUTH-PIECES.

1 Inch Pipe, per dozen,	\$1.00
1 1/4 “ “ “	1.75

### SPEAKING-TUBES (Tin).

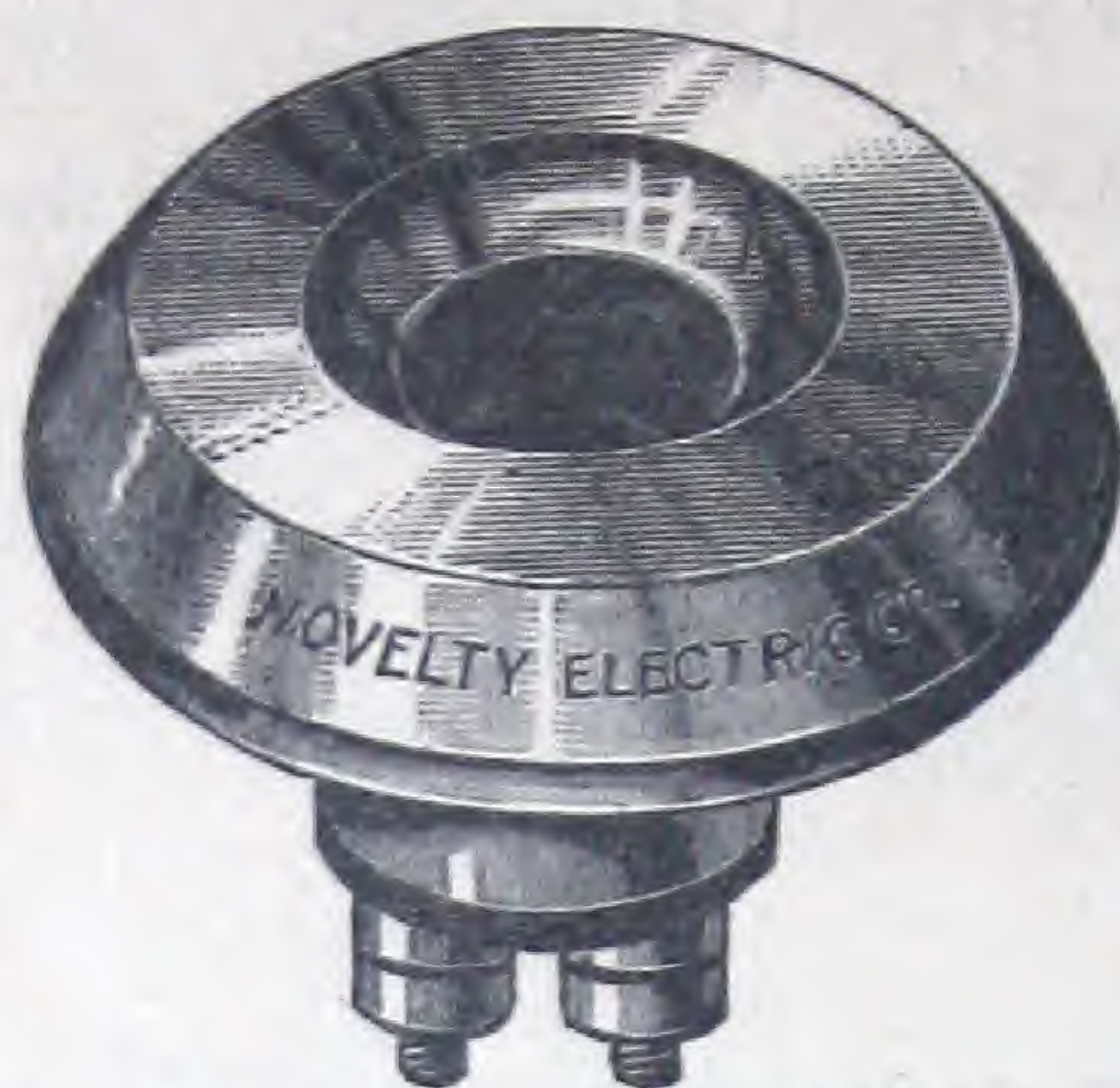
1 inch diameter, per foot,	\$ .04
1 1/4 “ “ “	.05
1 1/2 “ “ “	.06

### ELBOWS (Tin).

1 inch Elbows, each,	\$ .04
1 1/4 “ “ “	.05
1 1/2 “ “ “	.06



## PUSH BUTTONS.



ORNAMENTAL, ROUND.

Price, Brass, . . . 50 cts.  
 " Nickel-plated, . . 65 "



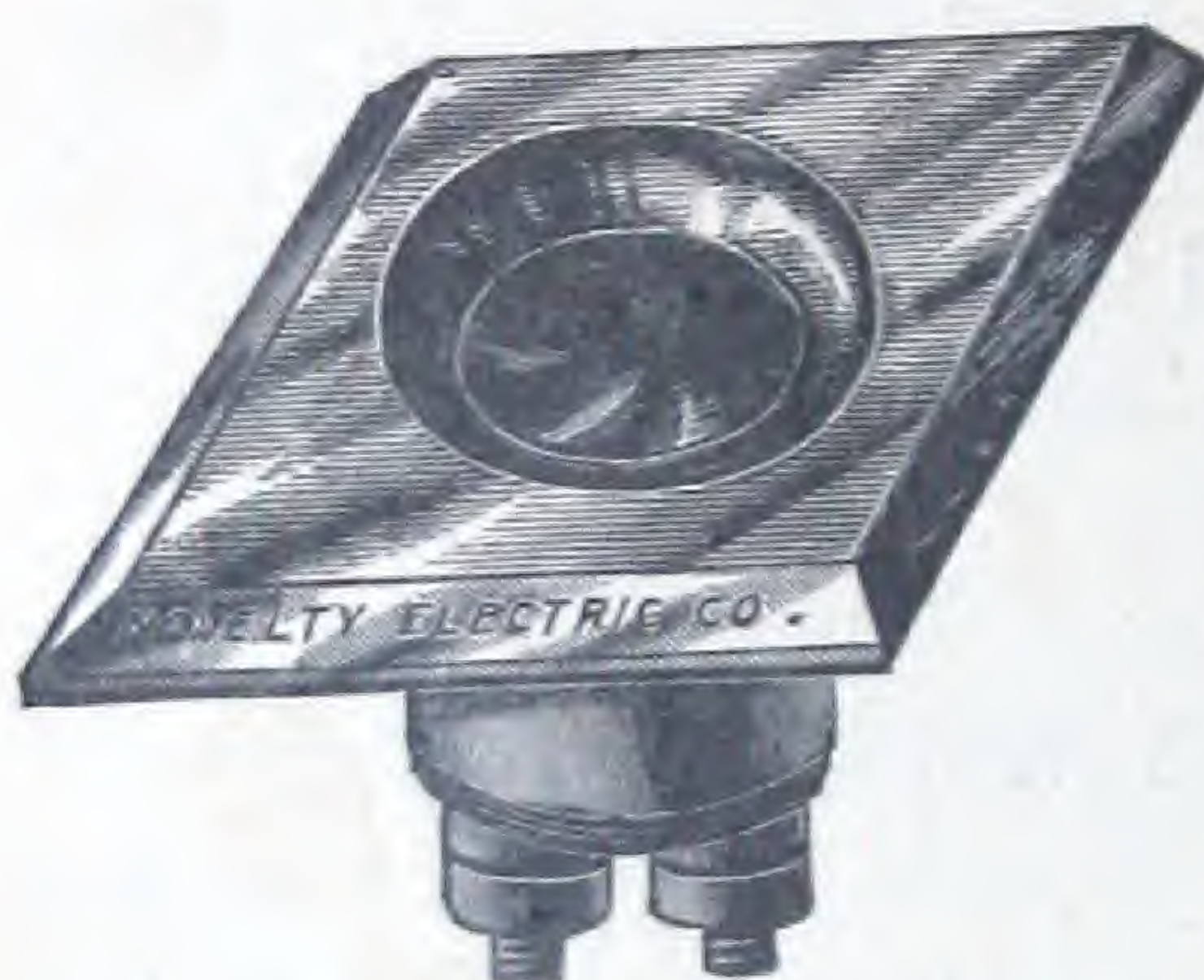
Economy Push.

Price,  
 Nickel-plated, 45c.



WOOD, ROUND.

Price, Rosewood, . . . 30 cts.  
 " Mahogany, . . . 25 "  
 " Walnut, . . . 25 "



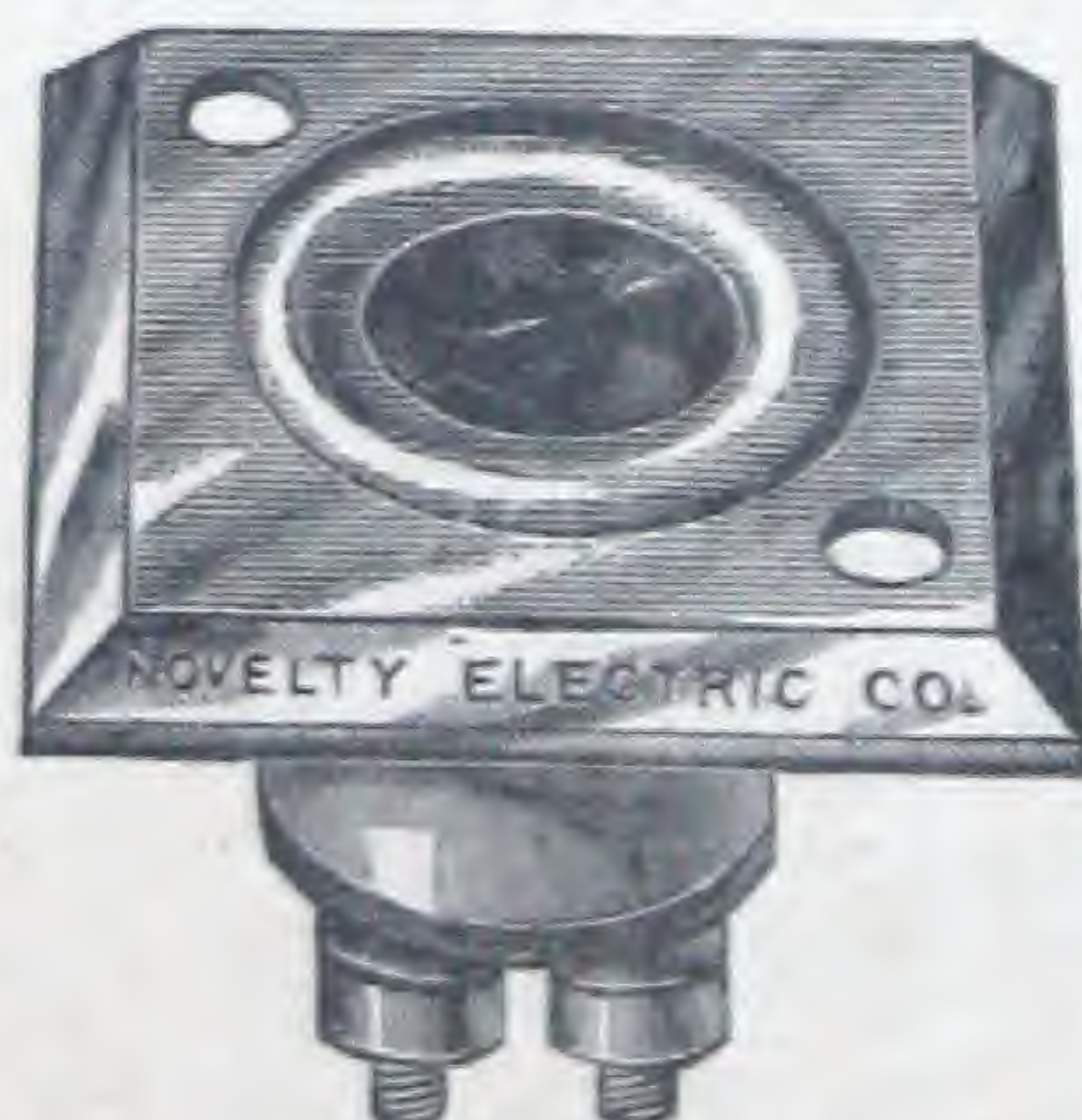
ORNAMENTAL, DIAMOND.

Price, Brass, . . . 60 cts.  
 " Nickel-plated, . . 75 "



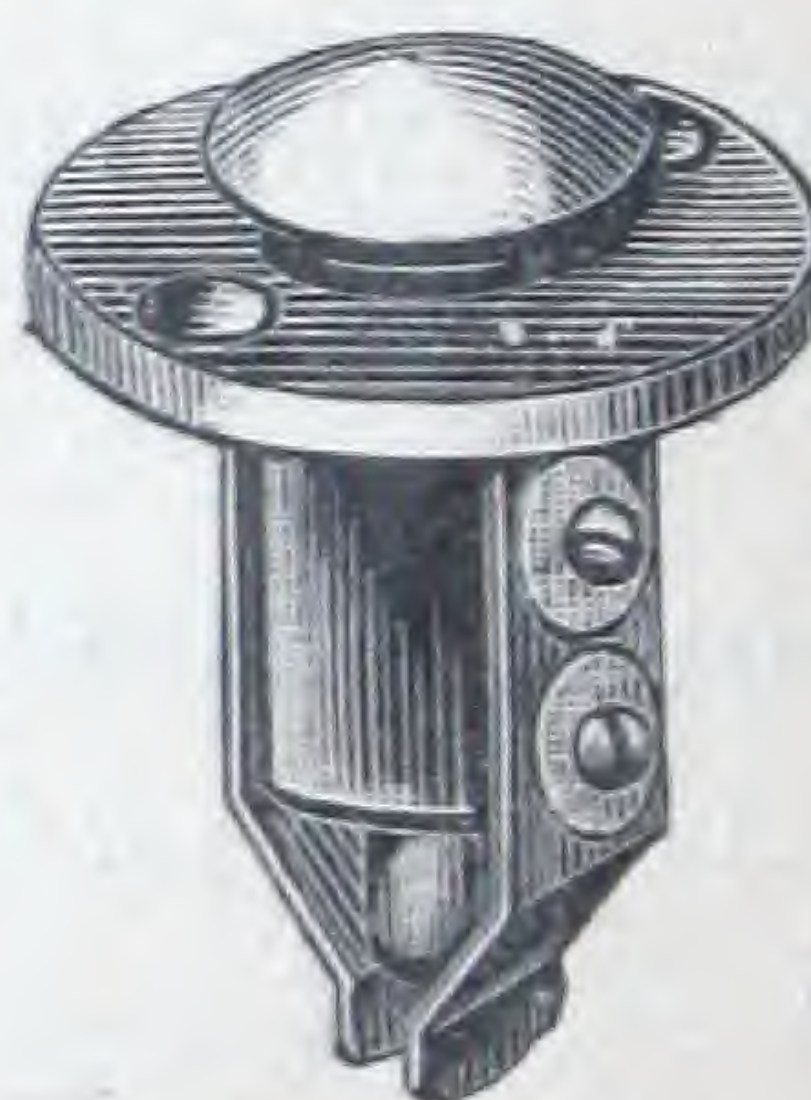
BRONZE PUSH BUTTON.

Price, Fancy, . . . 50 cts.



ORNAMENTAL, SQUARE.

Price, Brass, . . . 55 cts.  
 " Nickel-plated, . . 70 "



FLOOR PUSH.

Price, . . . 75 cts.

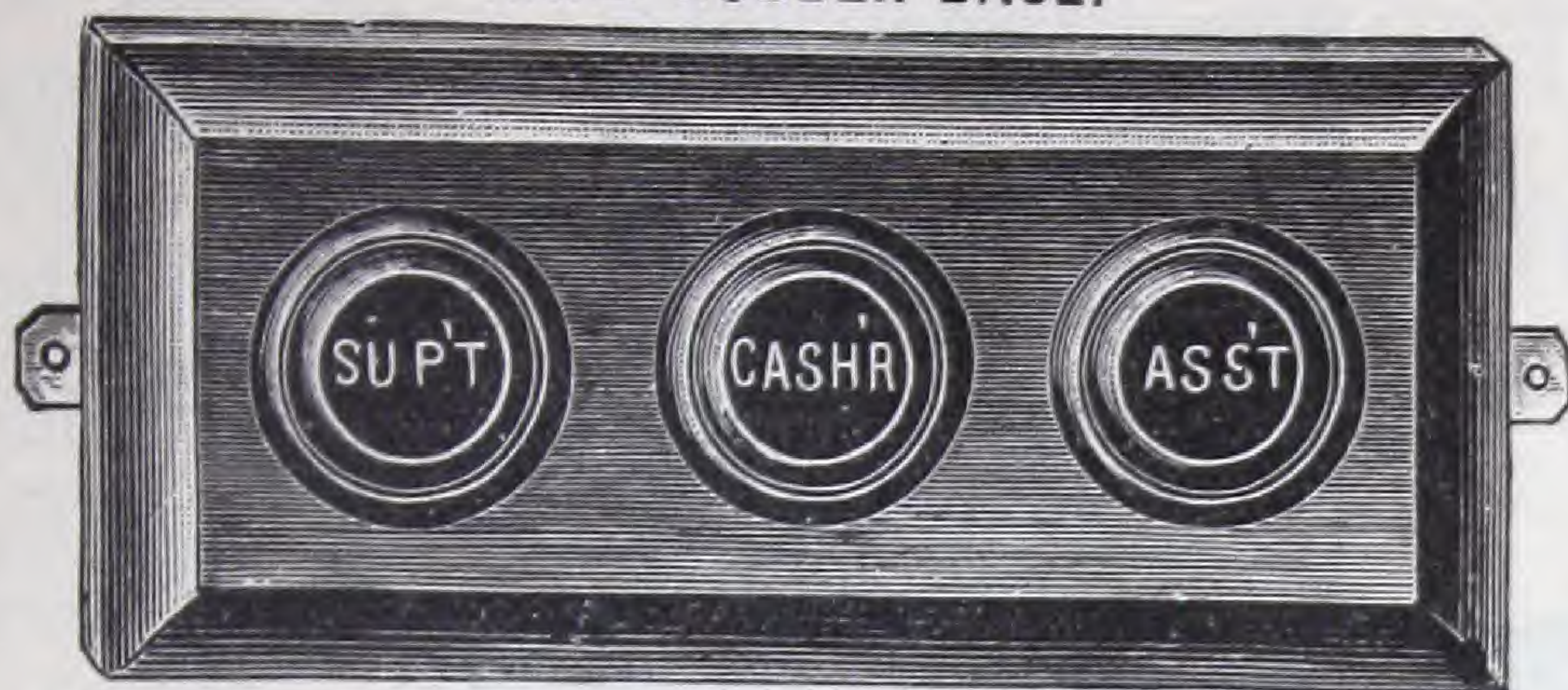


PORCELAIN PUSH BUTTON.

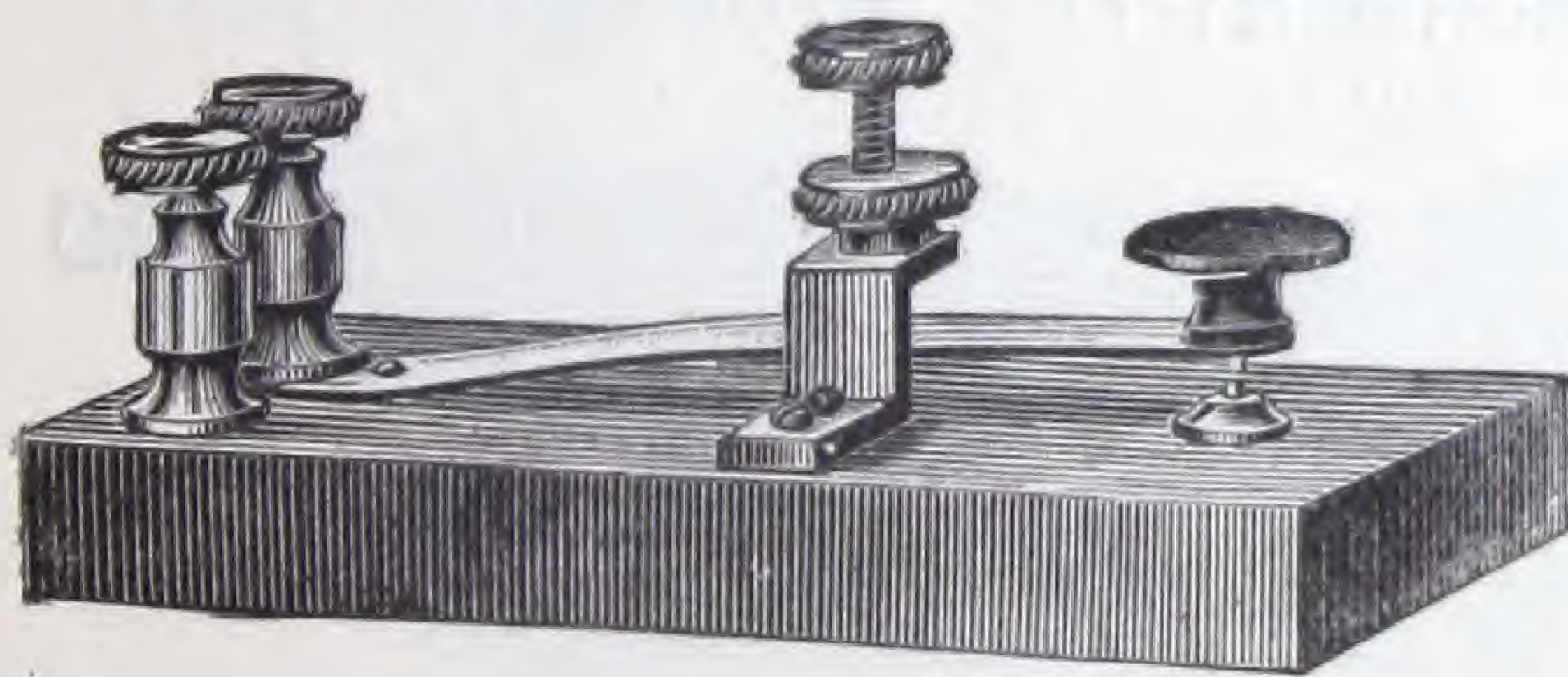
Price, fancy, . . . 30 cts.  
 " plain, . . . 50 "



**HARD RUBBER BASE.**

[illegible]

\$ .75



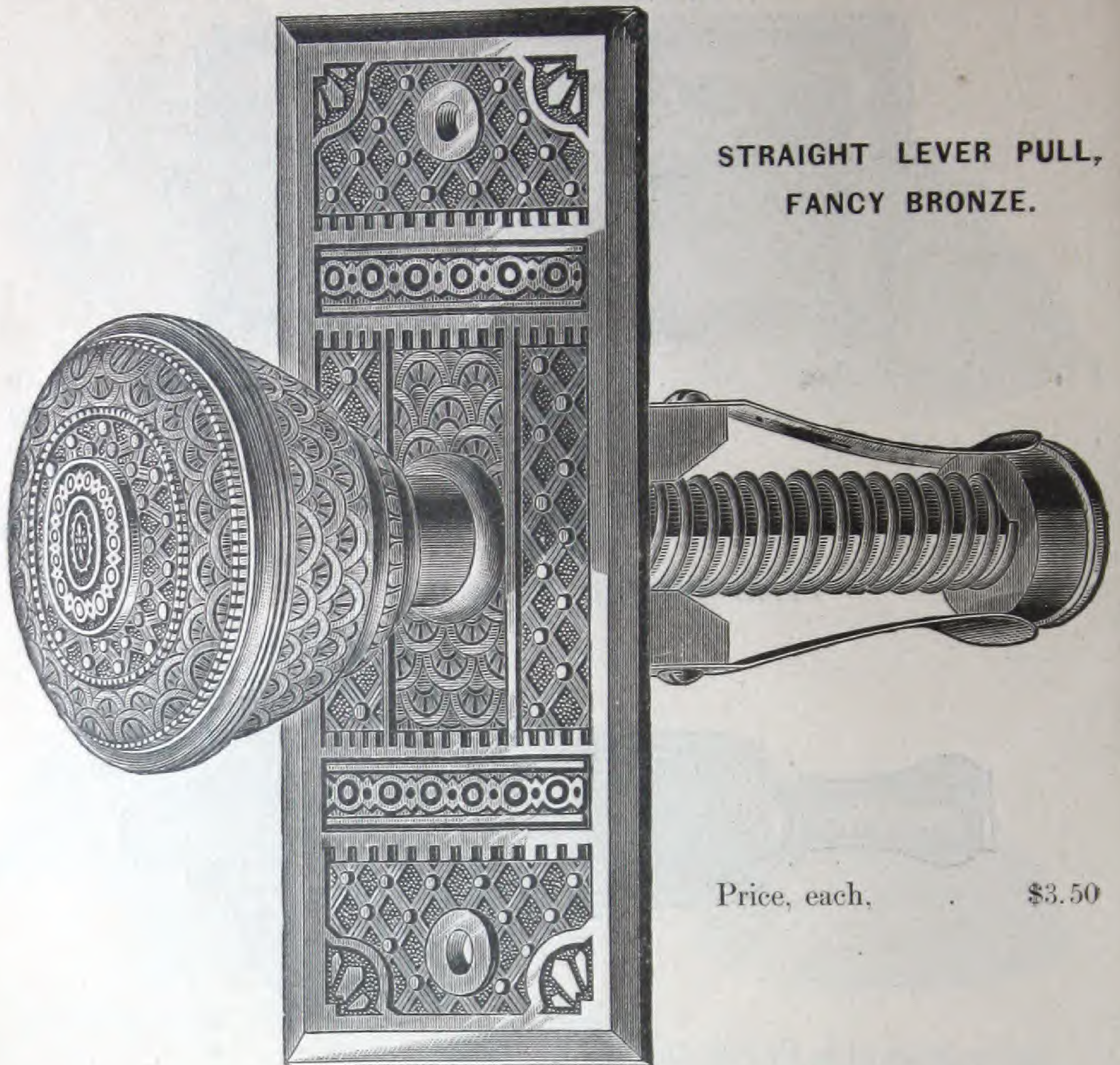
Price, Open Circuit,	\$ .75
“ Closed “	.75
“ Double “	1.00

## A detailed technical illustration of a mechanical component, possibly a valve or actuator. The component has a complex, symmetrical shape with a central diamond-shaped pattern. It features several circular ports or openings, including a large one on the left and smaller ones on the right and bottom. The surface is textured with fine lines, suggesting a metallic or machined material.

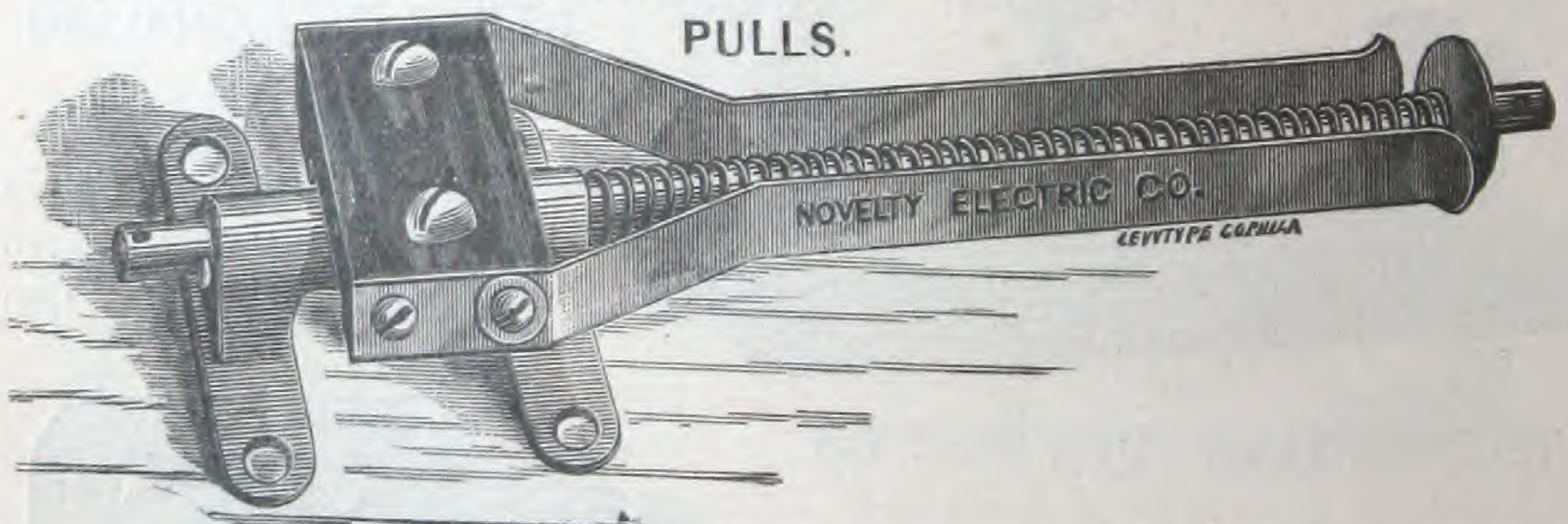
Price, . . . . \$1.75



## ELECTRICAL DOOR PULL.

STRAIGHT LEVER PULL,  
FANCY BRONZE.

Price, each, \$3.50

CIRCUIT CLOSING ATTACHMENT FOR MECHANICAL BELL  
PULLS.

This attachment can be connected with the usual style door pull to ring from one to three electric bells, located in any part of the premises. Can be connected without disturbing the bell pull already in use.

Price, each, 1 connection,	75 cents.
" " 2 "	85 "
" " 3 "	95 "



## BRONZE FRONT-DOOR PUSH BUTTON.

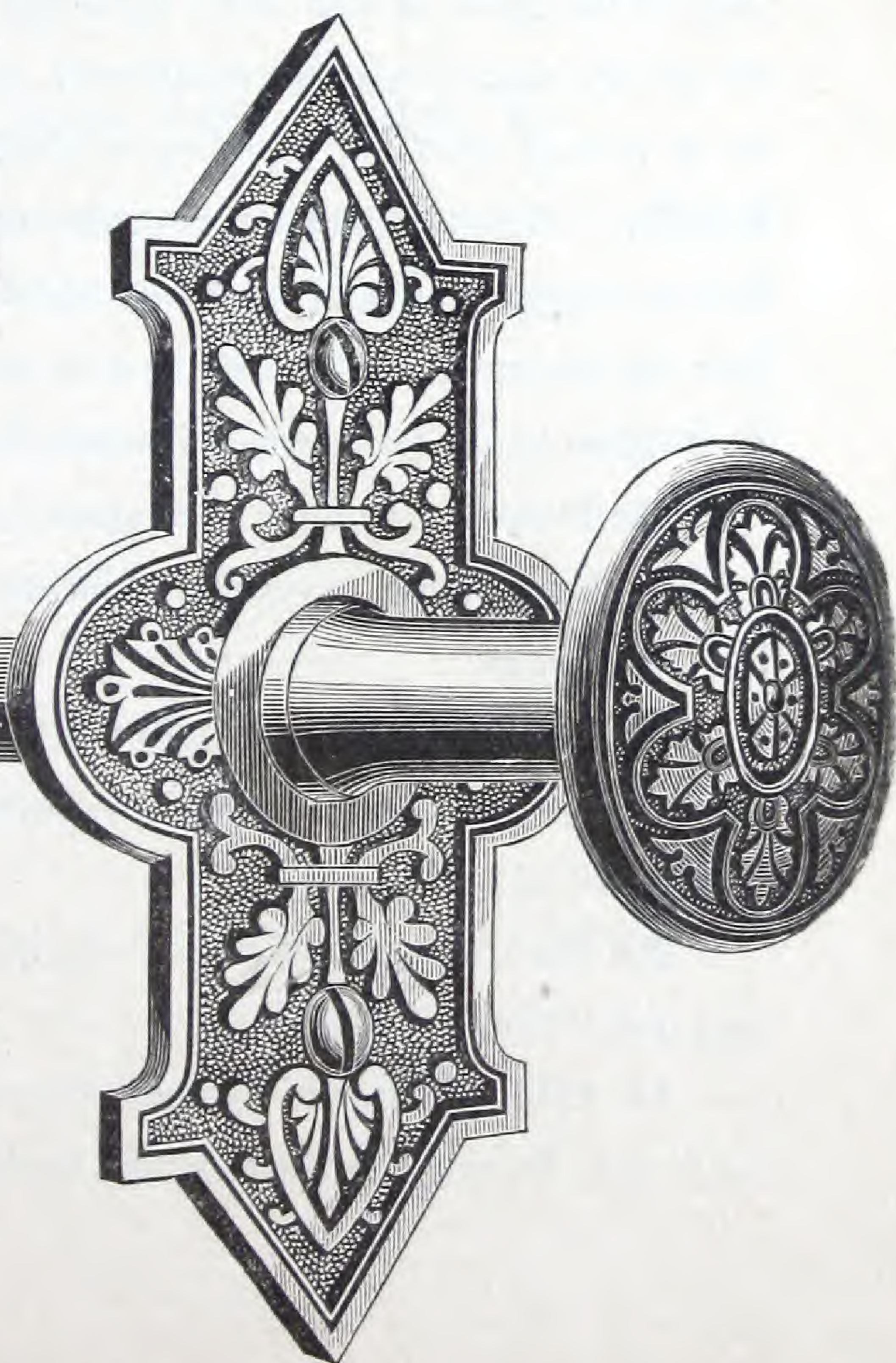
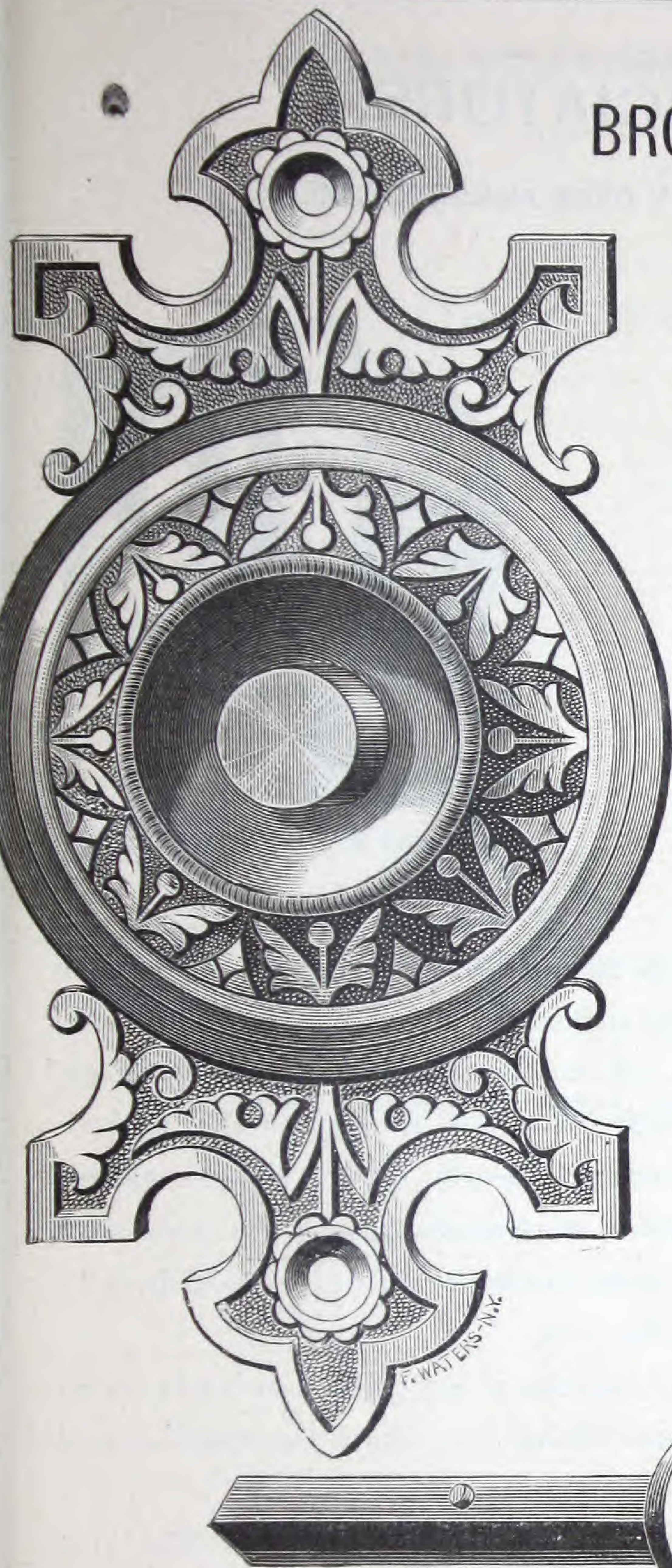
Price, . . . . . \$3.00

We can furnish Electric Door  
Pulls and Push Attachments, all styles,  
at prices ranging from \$1.50 to \$6.00.

### BRONZE DOOR-PULL.

Price, each, . . . . . \$1.00

“ “ with Electrical  
Attachment, . . . . . 1.50

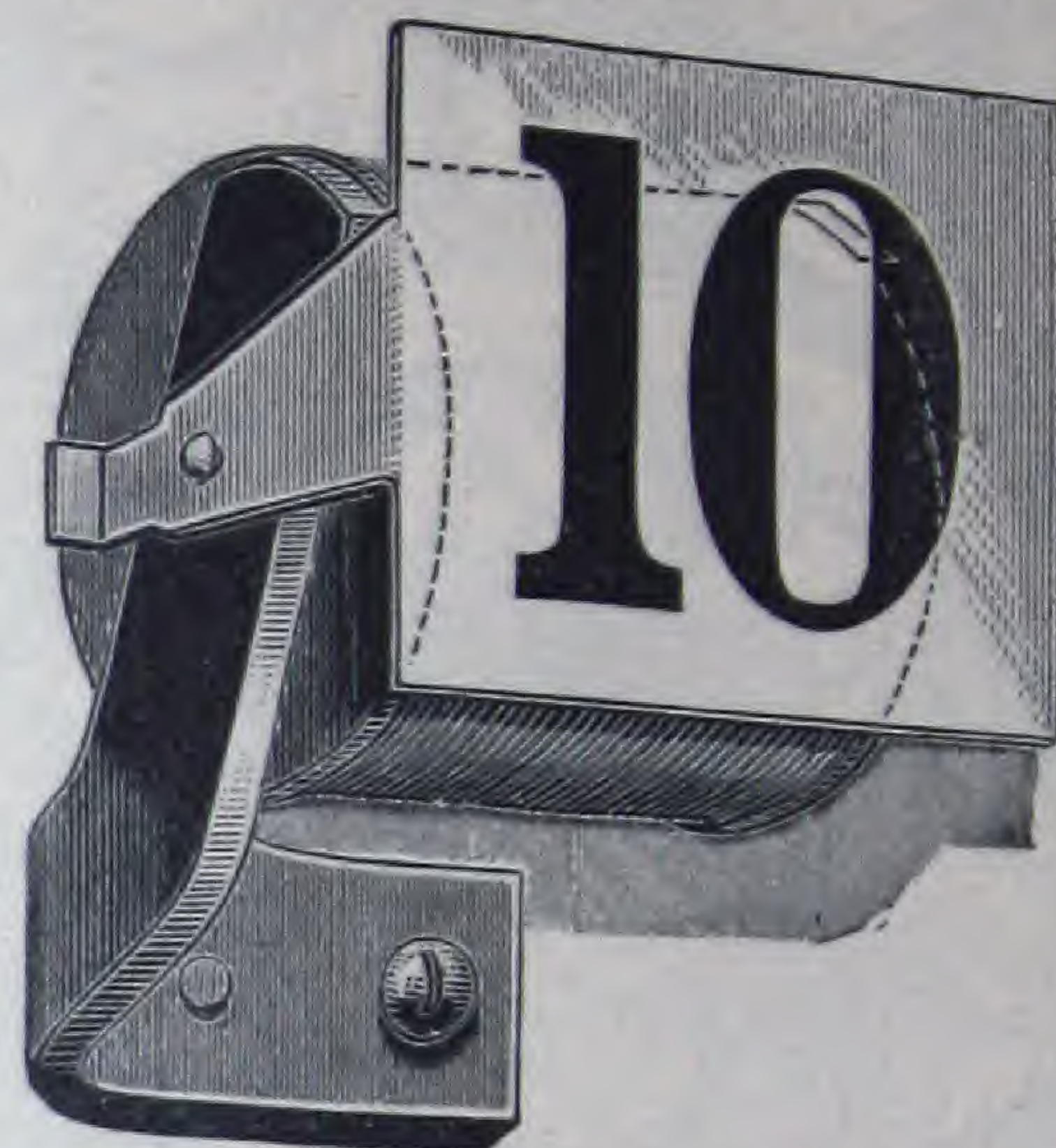
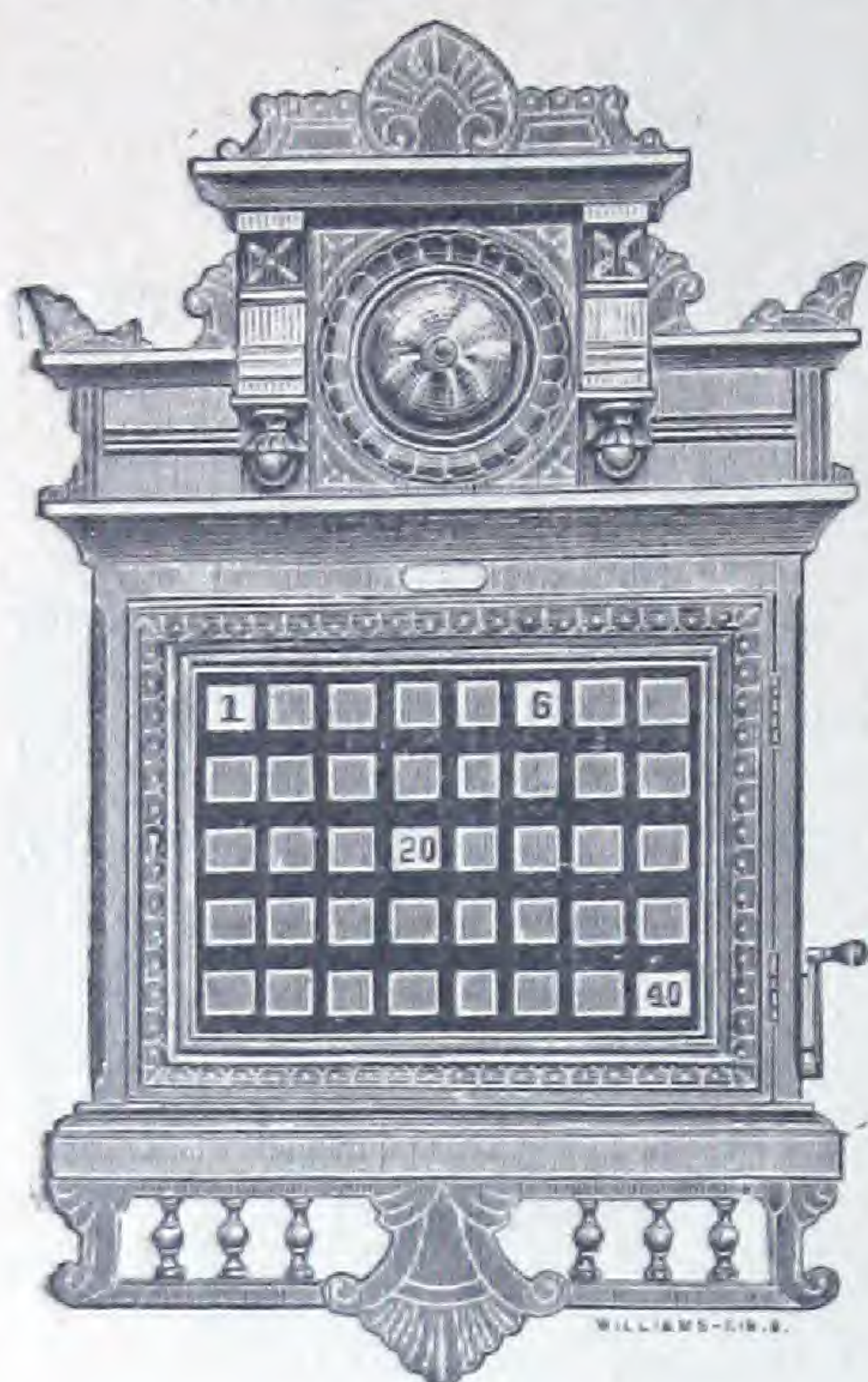


Electrical Attachments fitted  
to Bell Pulls already in use.



## ANNUNCIATORS.

## IMPROVED GRAVITY DROP ANNUNCIATOR.



Cut Showing Gravity Drop Down.

The Drop is made without weight or spring. By extending the core to the edge of the spool on each side, by means of iron lugs, which are riveted to the core, we get the result hereafter mentioned, and thus do away with weights and springs. In its normal condition, the drop or shield rests against the back of the case horizontally. When the current is passed through the coil, the lugs above mentioned become magnetized, and the Drop, which is substantially the armature, is attracted past the centre of gravity, and as soon as the current is released the shield drops by gravitation to the point where it meets the view.

The Drop occupies the least space in the case of any shield drop yet in practical operation, requiring the case to be but  $1\frac{3}{4}$  inches deep; the surface space occupied is  $1\frac{1}{2} \times 1\frac{3}{4}$  inches.

We handle two styles of this Gravity Annunciator, Nos. 1 and 2. The No. 1 Annunciators all have plain walnut, cherry or ash cases, plain painted front, and 3 inch nickel-plated gong bell.

The No. 2 Annunciators have highly finished cases, elaborately painted front, and nickel-plated 3 inch gong.

All Annunciators are so made that the front can be taken off, or swing back on hinges, leaving the entire works visible.



## ANNUNCIATORS—Continued.

### IMPROVED GRAVITY DROP, STYLE No. 1.

For Factories, Offices, Cottages, &c.

4 Numbers, with Bell.....	\$10.00
5    "       "       " .....	12.00
6    "       "       " .....	13.00
8    "       "       " .....	16.00
10   "       "       " .....	20.00
12   "       "       " .....	24.00
15   "       "       " .....	32.00
16   "       "       " .....	33.50
18   "       "       " .....	36.00
20   "       "       " .....	42.00

### IMPROVED GRAVITY DROP, STYLE No. 2.

For Fine Residences, Hotels, Banks, Public Buildings, &c.

4 Numbers, with Bell.....	\$17.00
5    "       "       " .....	17.50
6    "       "       " .....	18.00
8    "       "       " .....	20.00
10   "       "       " .....	24.00
12   "       "       " .....	28.00
14   "       "       " .....	32.00
16   "       "       " .....	36.00
18   "       "       " .....	40.00
20   "       "       " .....	44.00
20 to 50 Drops.....	\$1.75 per Drop.
50 to 60   " .....	1 65   "   "
60 to 75   " .....	1.50   "   "
75 to 100   " .....	1.40   "   "



## NEEDLE ANNUNCIATORS.

For Use in Hotels, Dwellings, Offices, &c.

The indications and the numbers indicated are very distinct, and are readily recognized from any point where the face of the dial can be seen. Handsome in appearance, durable, and of the best workmanship. We have no hesitation in recommending them to our customers.



### STYLE A.

Elegant black walnut cases, ebony and gold finish, bell and mountings nickel-plated.

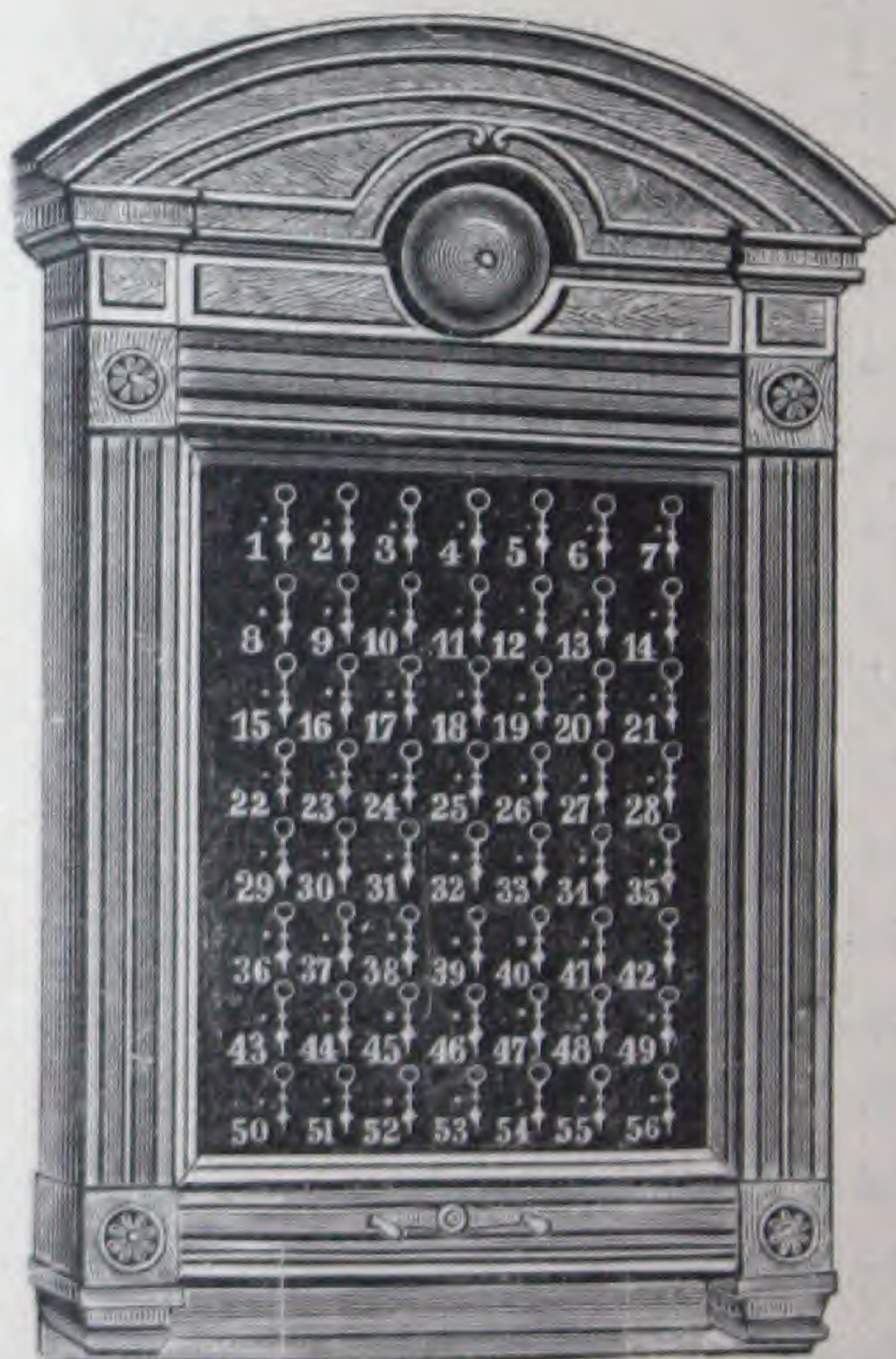
20 Numbers, including 4 in. Bell.....	\$55.00
30     "                 "                 " .....	70.00
40     "                 "                 " .....	90.00
50     "                 "                 " .....	110.00
60     "                 "                 " .....	125.00
70     "                 "                 " .....	140.00
80     "                 "                 " .....	155.00
90     "                 "                 " .....	175.00
100    "                 "                 " .....	195.00

Over 100 Numbers, special prices.

### STYLE B.

Very finely finished walnut, ash or oak cases, hinged glass front, nickel-plated bell and mountings, equal in every respect to the cases furnished by other manufacturers. A 4-in. nickel-plated bell is mounted on every Annunciator.

	STYLE B.	STYLE C.
20 Numbers.....	\$ 45.00.....	\$ 55.00
24     "                 " .....	52.00.....	62.00
25     "                 " .....	54.00.....	64.00
30     "                 " .....	58.00.....	68.00
35     "                 " .....	66.00.....	76.00
36     "                 " .....	68.00.....	78.00
40     "                 " .....	75.00.....	85.00
42     "                 " .....	79.00.....	89.00
45     "                 " .....	85.00.....	95.00
48     "                 " .....	90.00.....	100.00
50     "                 " .....	93.00.....	106.00
54     "                 " .....	98.00.....	111.00
56     "                 " .....	100.00.....	113.00
60     "                 " .....	108.00.....	121.00
63     "                 " .....	113.00.....	126.00
66     "                 " .....	118.00.....	131.00
70     "                 " .....	123.00.....	136.00
72     "                 " .....	125.00.....	138.00
77     "                 " .....	130.00.....	143.00



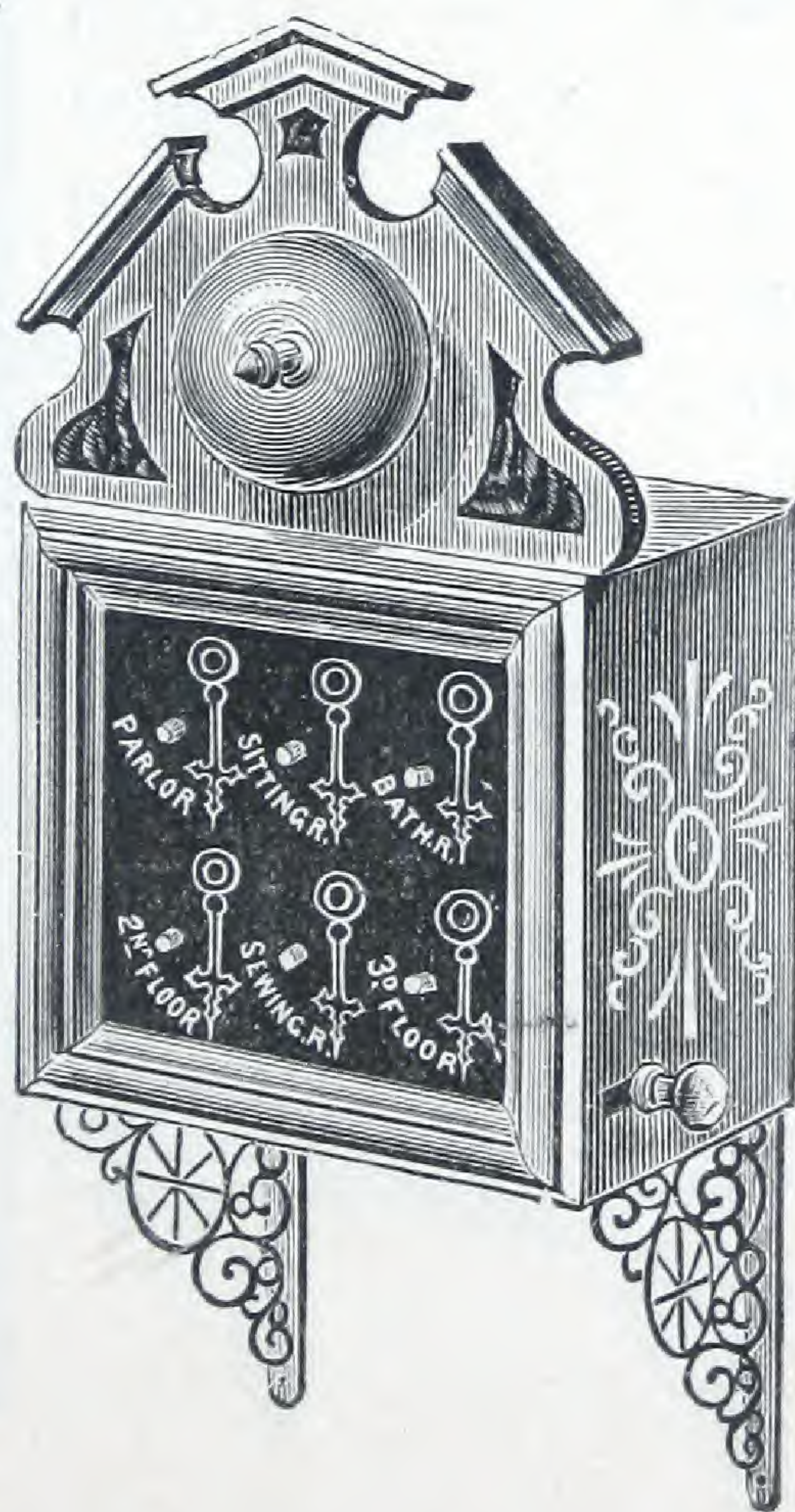
Annunciators requiring Numbers between those specified in our list will be charged for at the rate given for the next highest Number.



### STYLE C.

*Annunciators requiring Numbers between those specified in our list will be charged for at the rate given for the next highest Number.*

Any special design or case will be furnished to order. All the above sizes are kept constantly in stock in black walnut. Ash or oak cases will be furnished if desired. Single stroke or vibrating Bells furnished as ordered.

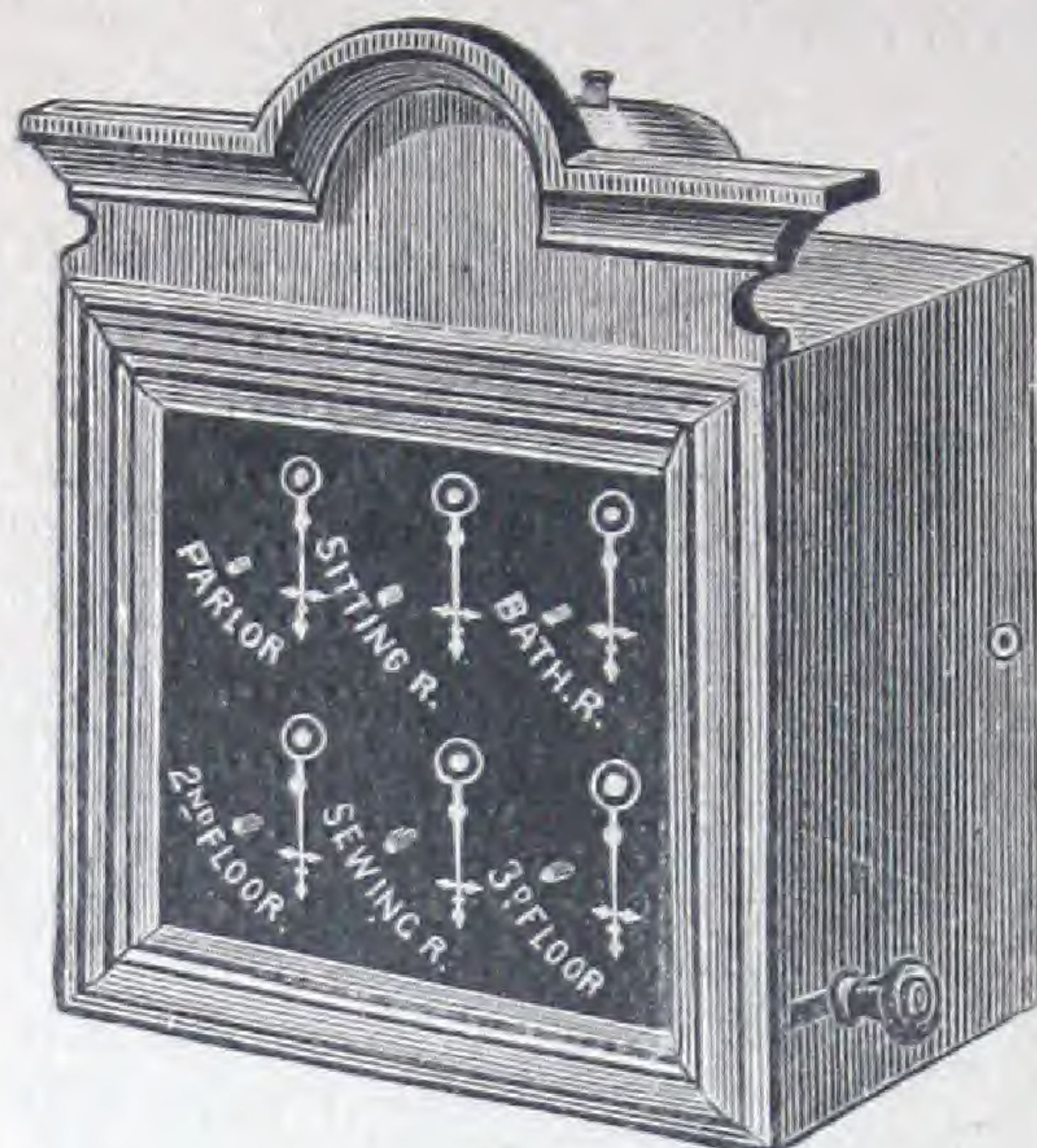




## NEEDLE ANNUNCIATORS—Continued.

## No. 2.

## PRICES.



4 Numbers, including Bell.....	\$17.00
6    "                   "                   " .....	18.00
8    "                   "                   " .....	20.00
9    "                   "                   " .....	22.00
10   "                   "                   " .....	23.00
12   "                   "                   " .....	25.00
14   "                   "                   " .....	28.00
15   "                   "                   " .....	30.00
18   "                   "                   " .....	35.00

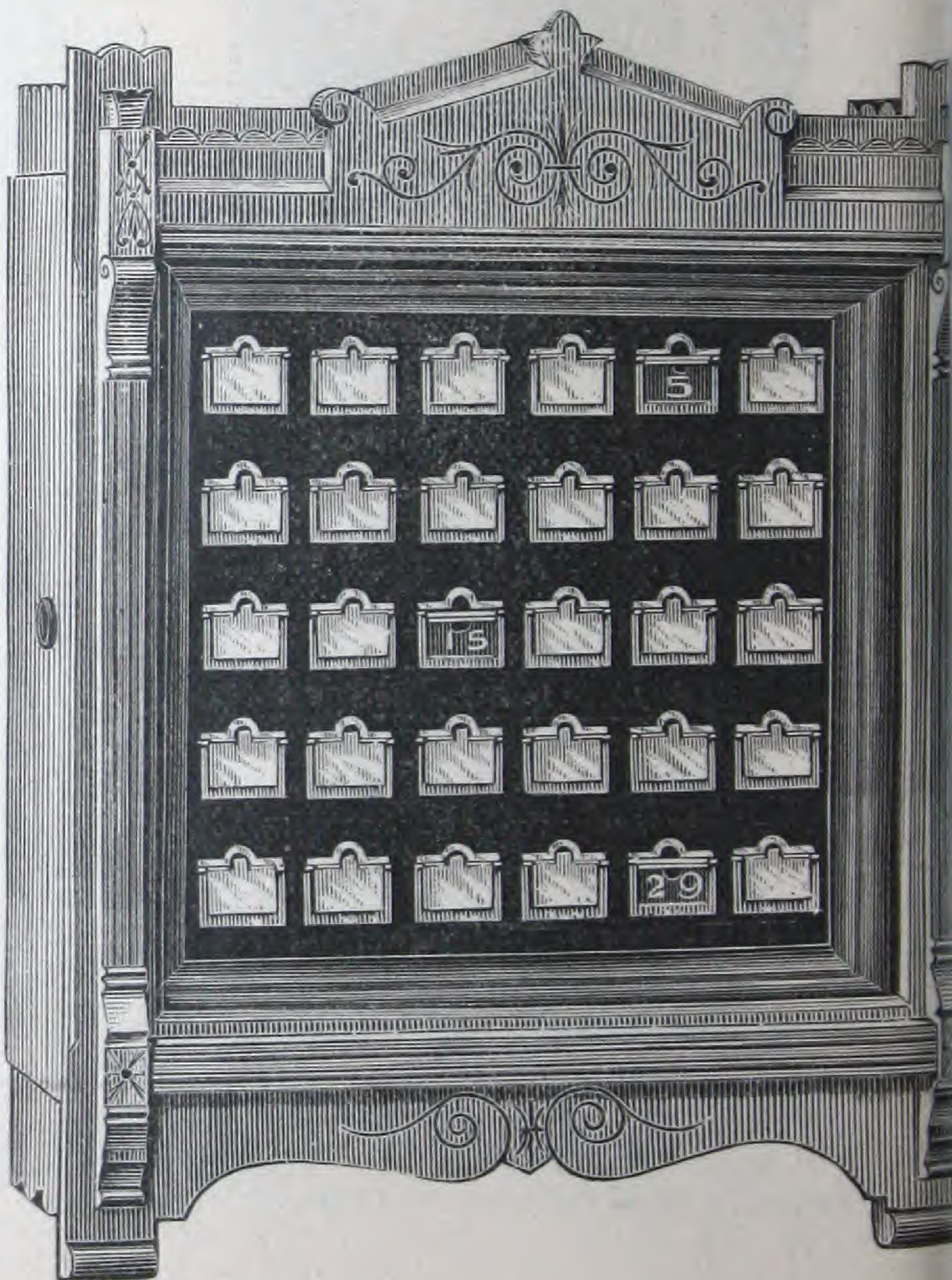
All the above sizes kept in stock in Ash and Walnut Cases. Any other woods and sizes furnished to order at short notice.

## IMPROVED LIFTING DROP ANNUNCIATOR.

## PRICES.

3 Indications.....	\$15.00
4    "                   " .....	20.00
6    "                   " .....	24.00
8    "                   " .....	29.00
10   "                   " .....	34.00
12   "                   " .....	38.00
15   "                   " .....	44.00
20   "                   " .....	54.00
20 to 100 Indications, 20.00	
per Indication.	

Any make of Annunciator not illustrated in this Catalogue furnished upon application.





## BURGLAR ALARM.

### GRAVITY DROP.

Same as in the Gravity Annunciator, including all the necessary plugs for cutting out, making tests of battery, windows, doors and bell.

No. 1, 4 Indications.....	\$21.00	No. 2, \$32.00
" 6 " .....	25.00	" 35.00
" 8 " .....	30.00	" 40.00
" 10 " .....	35.00	" 42.50
" 12 " .....	40.00	" 45.00
" 15 " .....	45.00	" 52.50

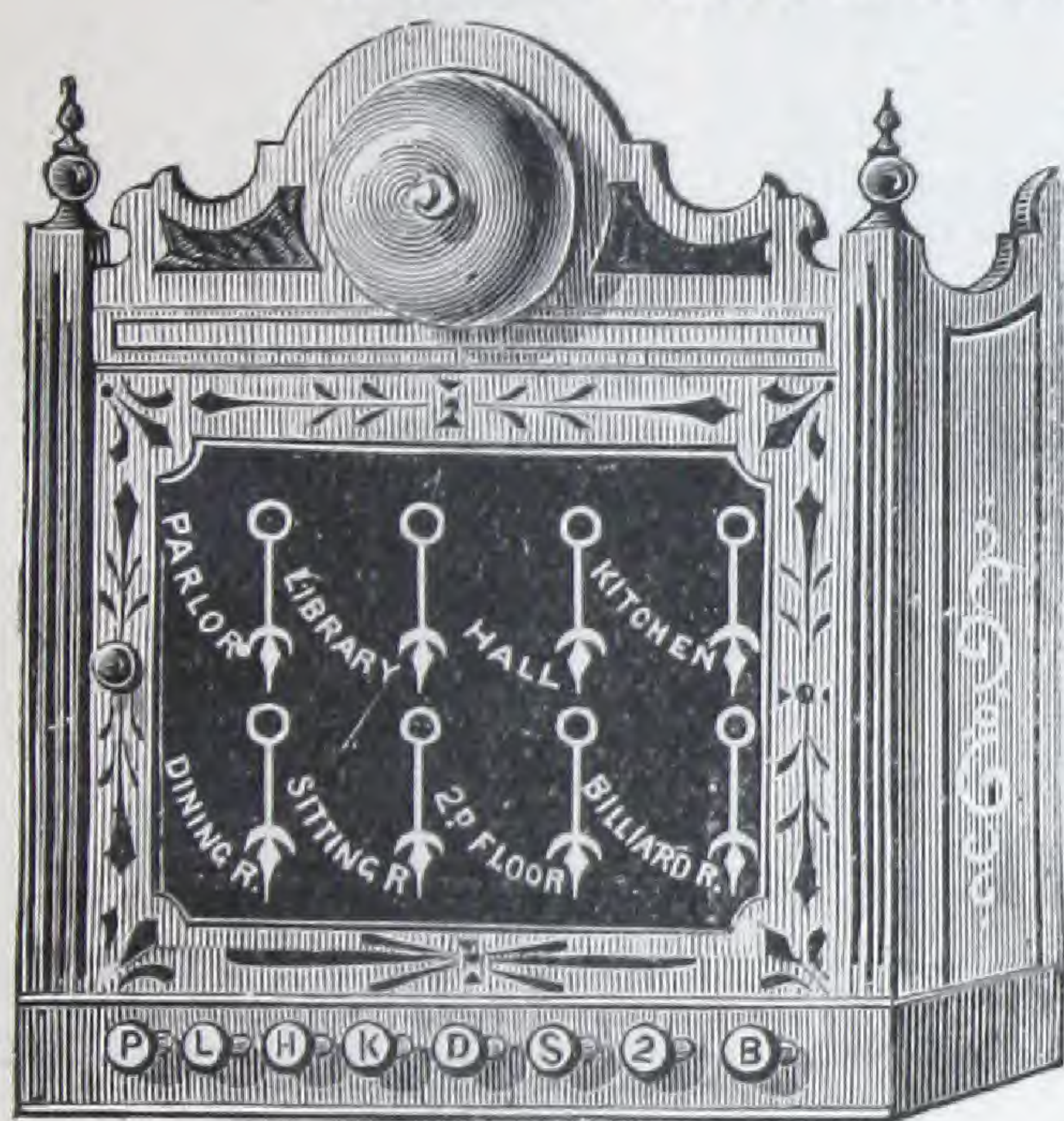
Special prices on larger instruments.

### NEEDLE BURGLAR ALARM ANNUNCIATORS.

#### Style No. 2.

Finest finished cases; bell, etc., nickel-plated, with continuous ringing attachment, silent test, etc.

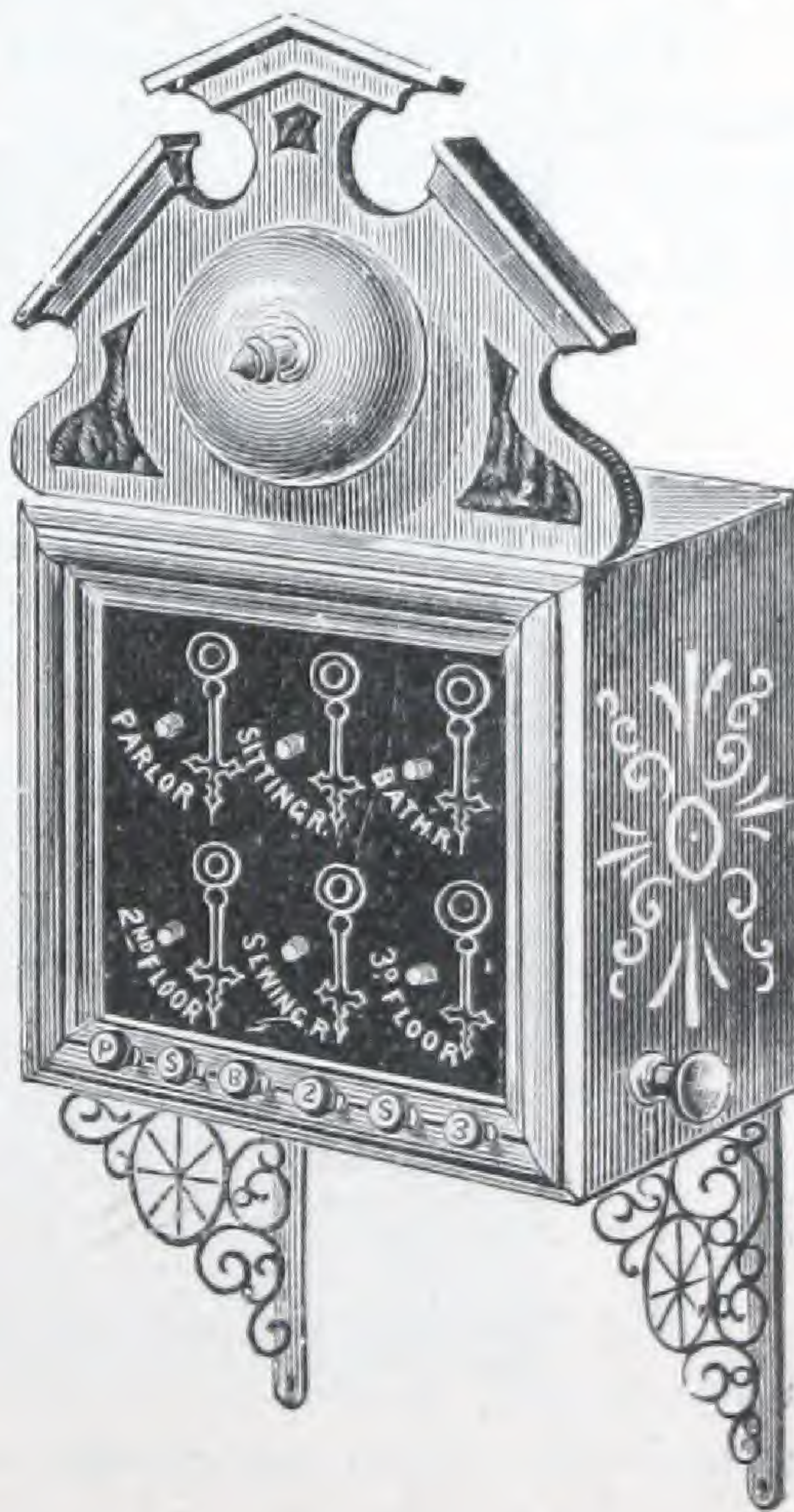
4 Indications.....	\$32.00
6 " .....	35.00
8 " .....	40.00
9 " .....	42.50
10 " .....	45.00
12 " .....	50.00
14 " .....	52.50
15 " .....	55.00
18 " .....	60.00



#### Style No. 3.

Well finished black walnut cases, with continuous ringing attachment, silent test, etc.

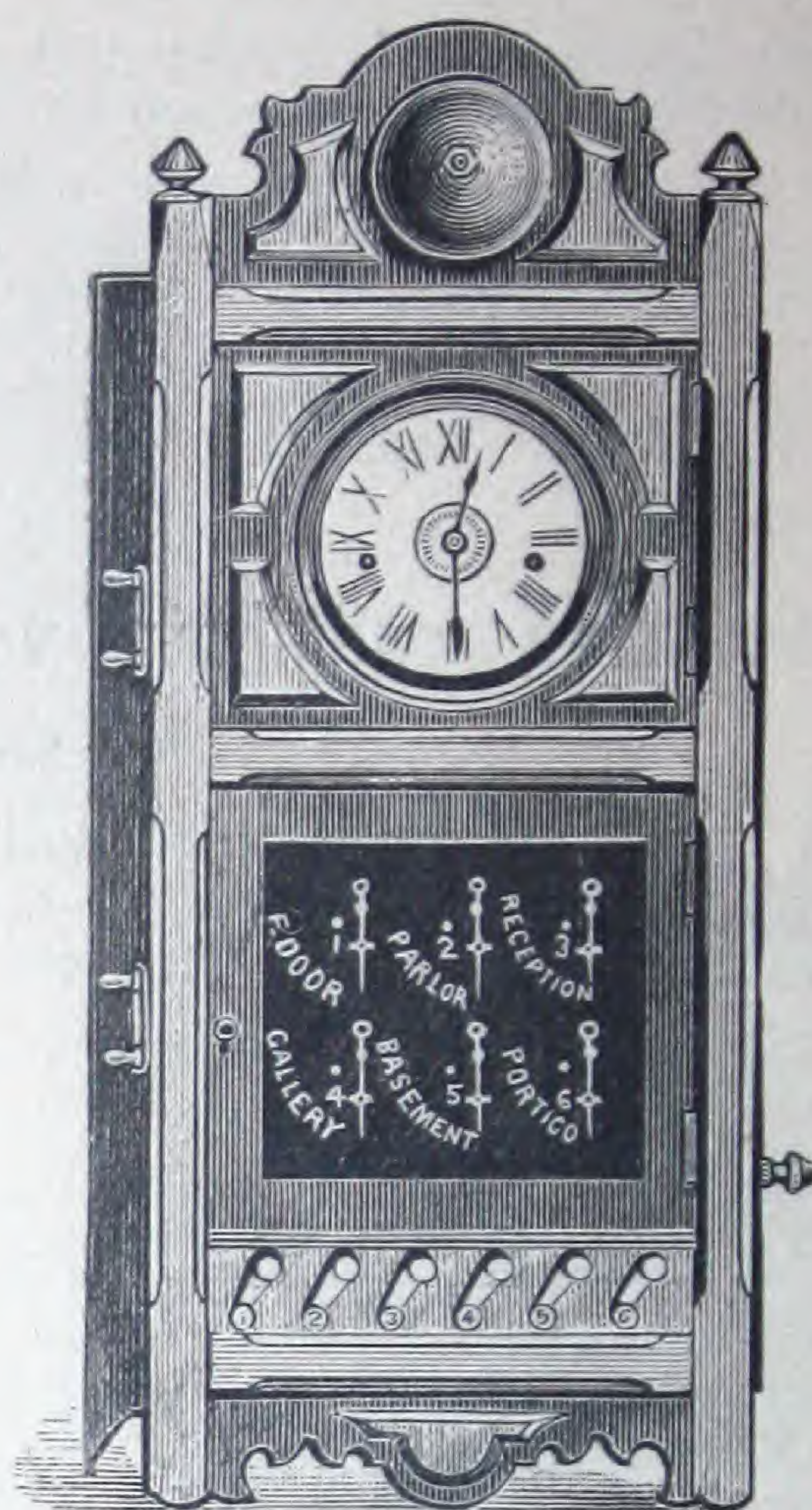
4 Indications.....	\$21.00
6 " .....	25.00
8 " .....	30.00
9 " .....	33.00
10 " .....	35.00
12 " .....	40.00
14 " .....	42.50
15 " .....	45.00
18 " .....	50.00





## BURGLAR ALARMS.

WITH CLOCK CUT-OFF AND ATTACHMENTS.



Clock Cut-Off consists of a first-class eight-day movement, with extra dial for automatically switching off an alarm at any desired hour. Furnished in ash or walnut cases.

Price each, . . . . . \$15.00

### Clock Cut-Off, with Servant's Call, No. 1.

The servant is obliged to turn off a switch in her room in morning, to stop bell from ringing. At night switch must be again set.

Price, . . . . . \$18.00

### Clock Cut-Off, with Servant's Call, No. 2.

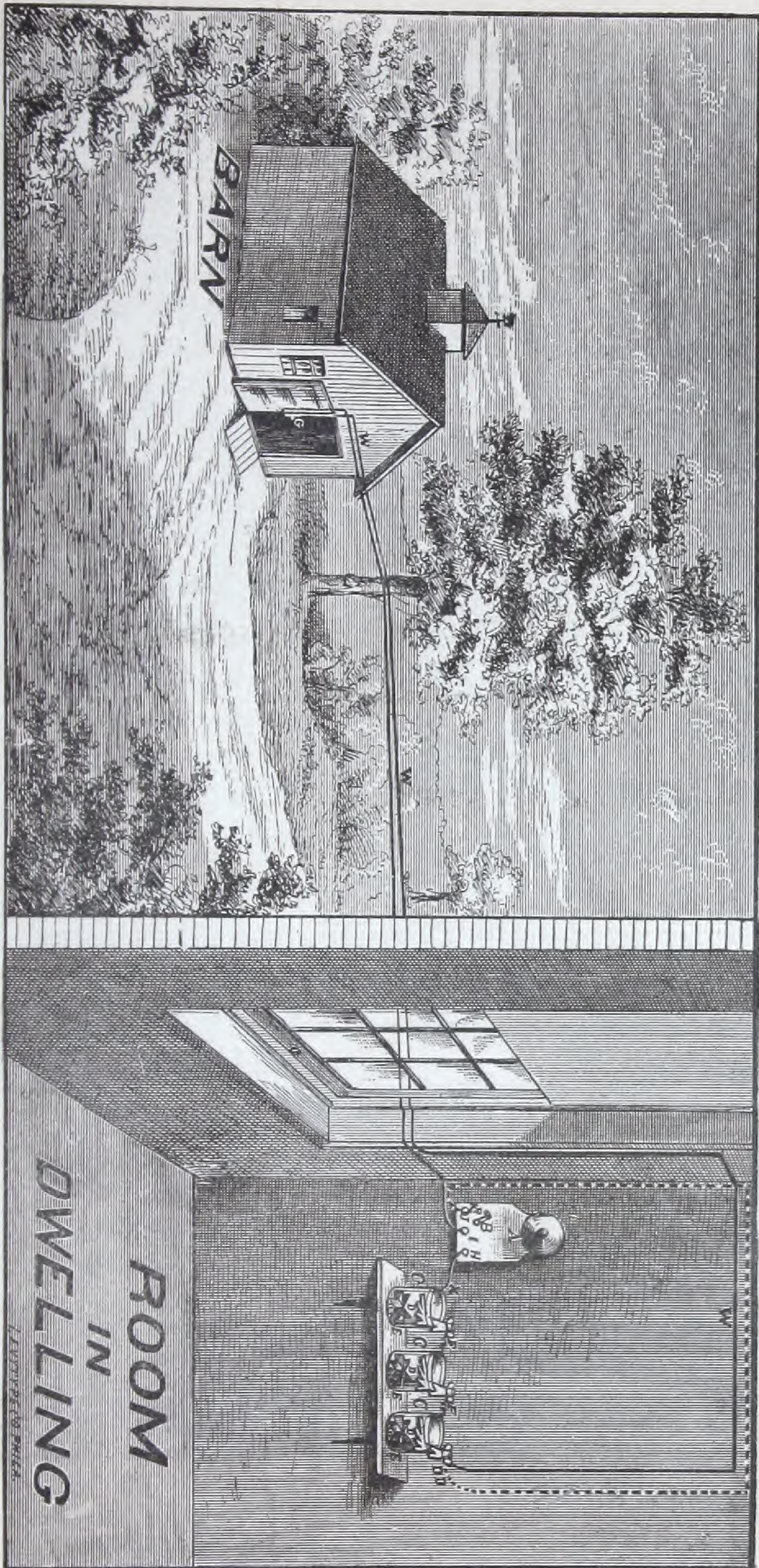
Automatic set-back, in which a button located in servant's room, on being pressed after the bell is rung, opens circuit on bell. No switch in servant's room is required. The turning on of switch on burglar alarm at night sets the servant's call bell *automatically*.

Price, . . . . . \$20.00

We will place the above attachments in any of our styles of Burglar Alarms at above prices, in addition to price of alarms. Above cut shows the cut-off attached to style No. 2 Burglar Alarm.



## BURGLAR ALARMS.



WRITE FOR DESCRIPTIVE CIRCULAR.

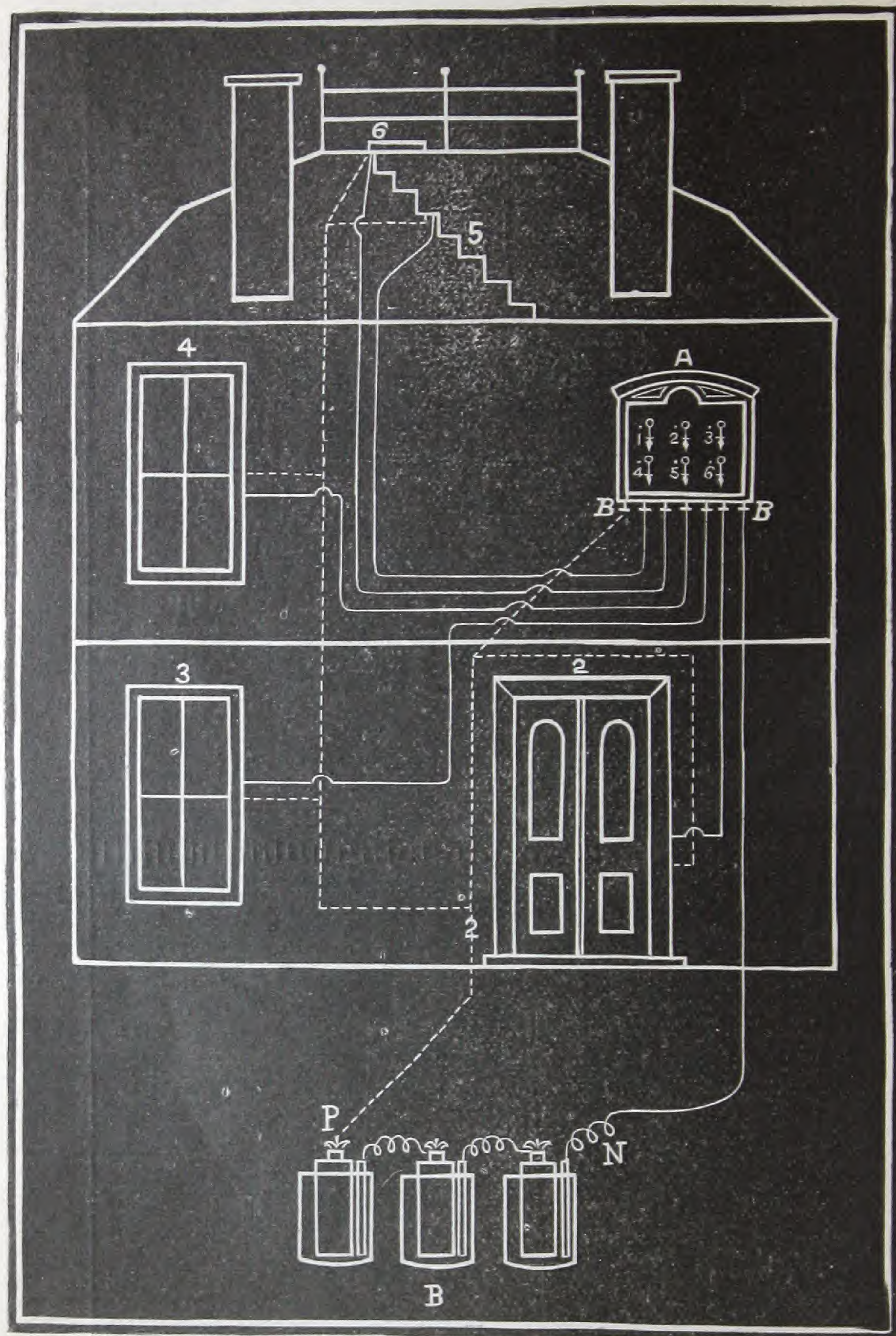
The Novelty Electric Co.'s Closed Circuit Burglar Alarm, for protection of Barns, Stables, Chicken Houses,  
Corn Cribs, &c.

Price,

\$10.00



## Diagram of Connections for Burglar Alarm.



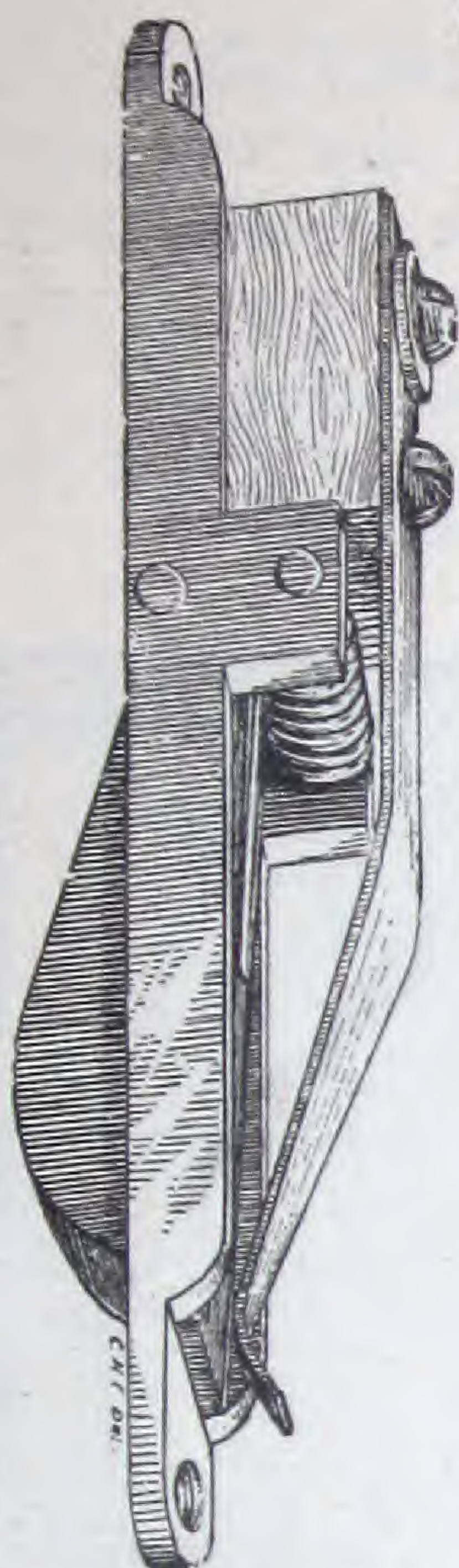
Showing wires and connections of a house fitted up with our Needle Burglar Alarm, showing one opening in each room, scuttle in the roof, and stairs in the attic.

We are prepared to furnish complete apparatus for "Burglar Alarms," or to furnish estimates and complete contracts.

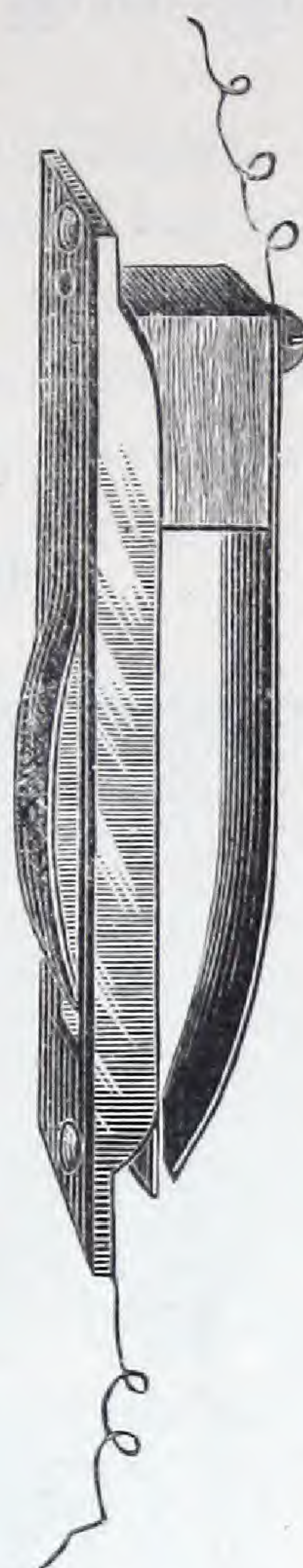


## DOOR AND WINDOW CONNECTIONS.

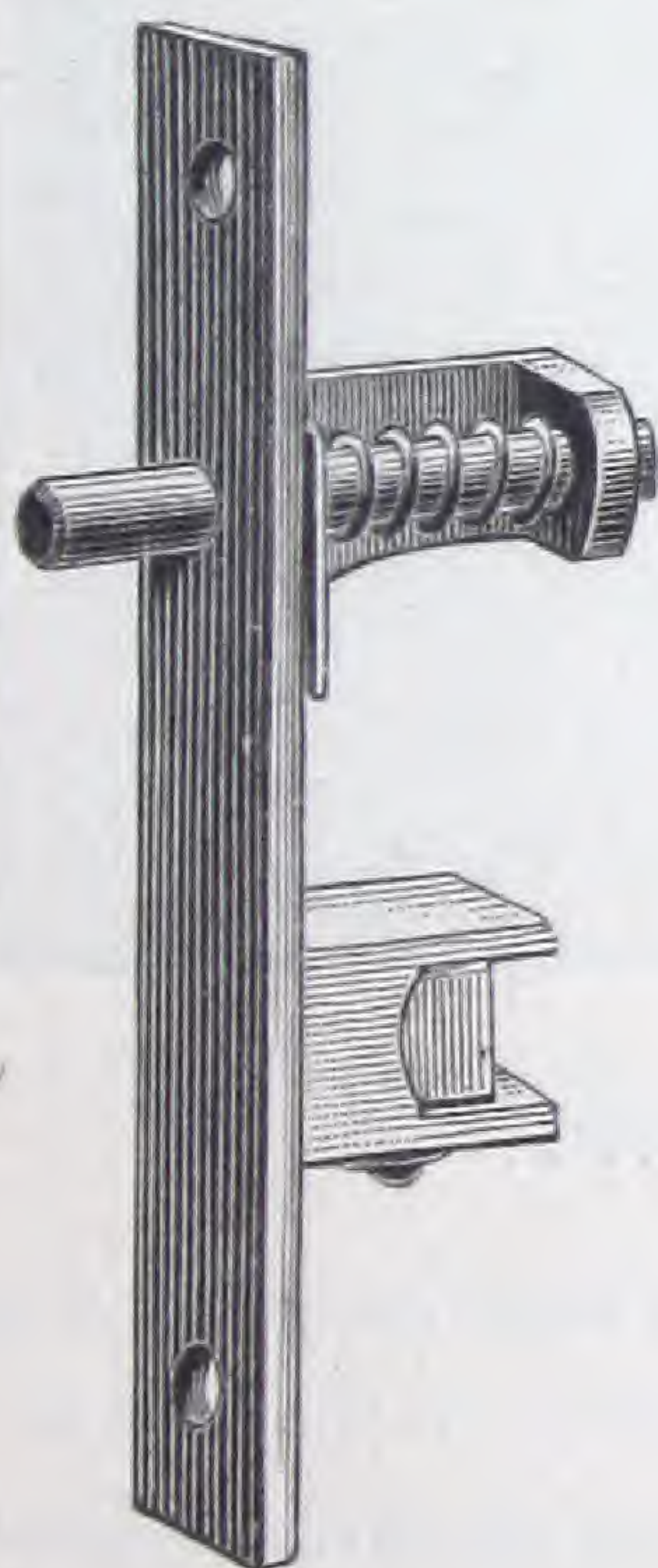
FOR BURGLAR ALARM.



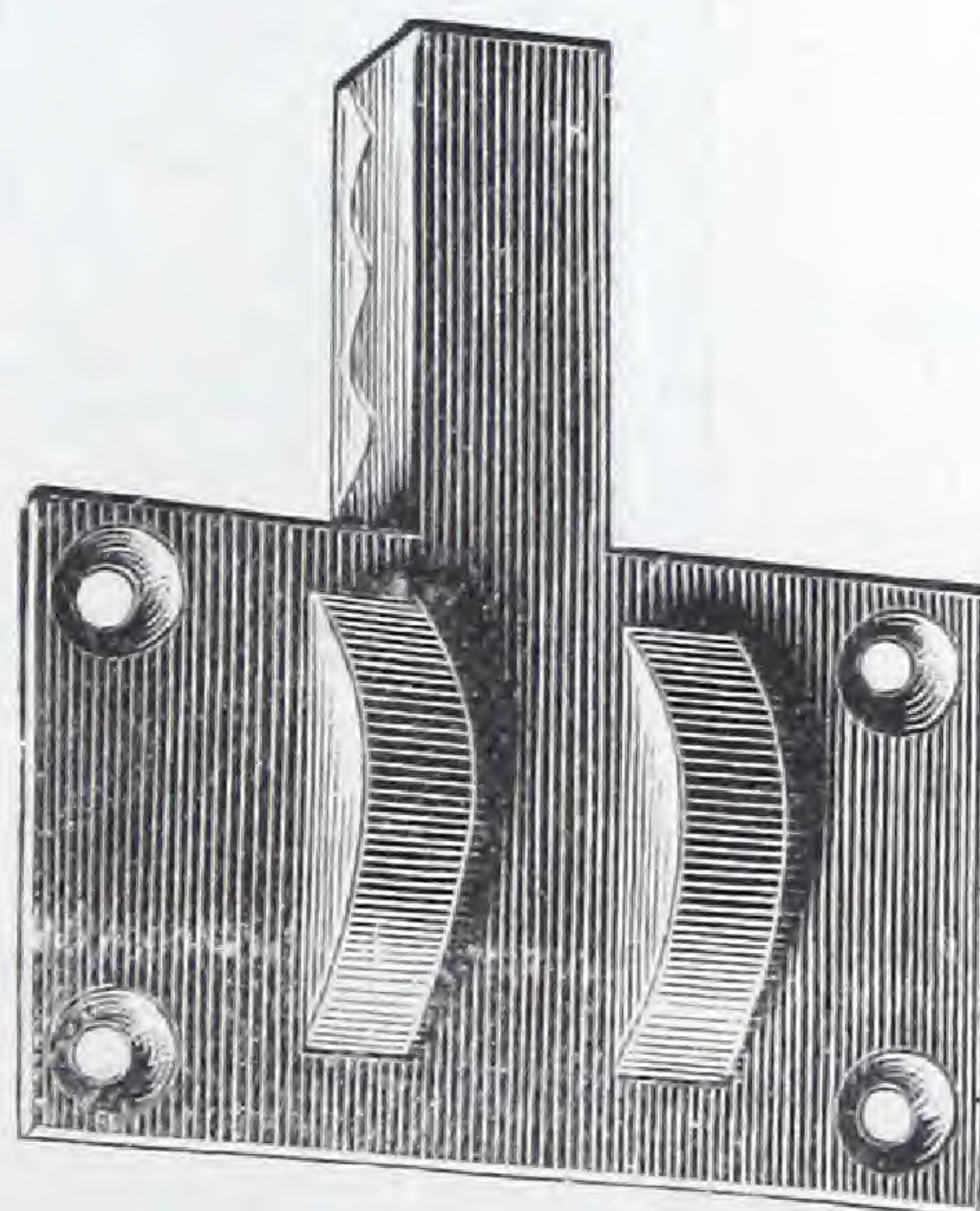
Single Window Spring.  
Extra quality.  
Price each, 30 cts.



Single Window Spring.  
Price each, 25 cts.



Door Spring.  
Price each, 25 cts.



Double Window Spring.  
Price each, 50 cts.



## Gas Lighting and Extinguishing by Electricity.

Lighting and extinguishing gas by electricity is meeting with popular favor, and being adopted in private residences, as well as in all public places. It dispenses with the use of matches, thereby avoiding danger. A saving of gas is also effected, owing to the convenience of lighting and extinguishing.

### THERE ARE SEVERAL STYLES OF



### ELECTRIC GAS LIGHTING.

First, that called the Automatic, by which the gas may be lighted and extinguished at a distance, being operated by pressing a *button* on the wall at any desired location, or from a *pear-shaped* push button hanging over bedstead. One *Automatic* can be lighted from as many different points as desired by duplicating the buttons.



## ELECTRIC GAS LIGHTING—Continued.

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Second. That termed the "*Pendant Burner*." The Gas being ignited by pulling an ornamental chain attached to the burner; a similar pulling of the chain extinguishes the gas.

Third. The "*Multiple System*," by which any number of gas jets are lighted simultaneously. It is adapted to Churches, Theatres, and Public Buildings.

The "*Automatic*" and the "*Pendant Burner*" can be used separately or together, being connected by the same battery, and are adjustable to any house, store, stable, factory, or any place where gas is used.

To operate the "*Pendant*" or "*Automatic*," a spark coil with the battery is required in the circuit.

It is claimed for this system that it is :

First. *Economical*, in preventing the waste of gas ; from the fact that the gas is turned off when not wanted, when in many cases it would be left burning were it necessary to light it in the old way.

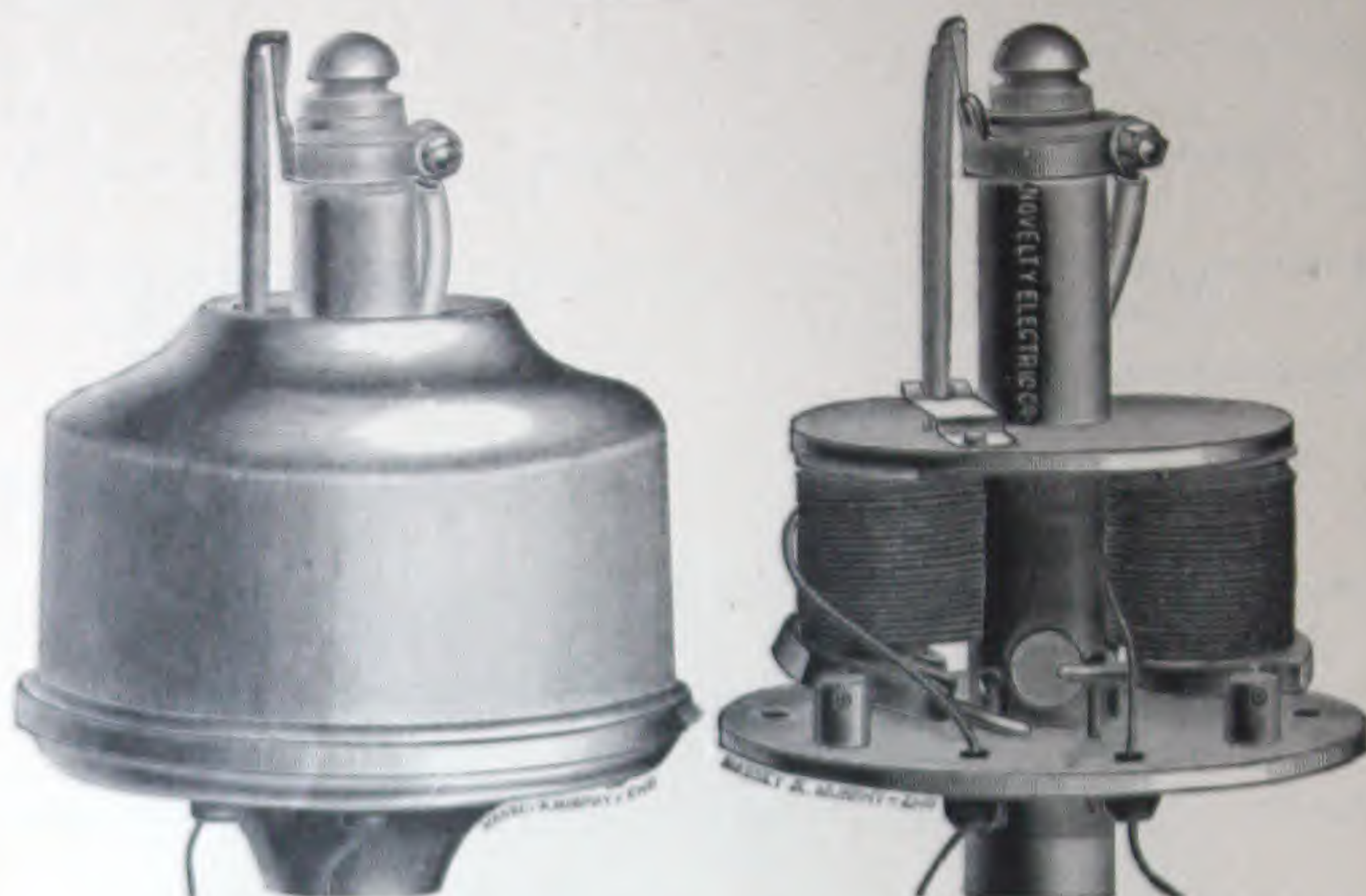
Second. Absolutely safe, in dispensing with the use of matches.

Estimates furnished for equipping *residences, churches, &c.*, and work done in first-class manner by experienced workmen of best character.



## ELECTRIC GAS LIGHTING—Continued.

## Automatic Electric Gas Burners.



The above plates represent (with or without shell) the celebrated Double Armature and Double Magnet Burners, now being extensively sold by us. The valve in this burner is *gas-tight*, and we can from past experience recommend it as a reliable and satisfactory burner.

## ADVICE ABOUT AUTOMATICS.

The mechanism of the Automatic, though perfectly constructed, needs to be handled with care. The above burners are all perfectly adjusted to work on from 4 to 6 cells Leclanche battery. If the *Automatic* fails to serve you promptly, the trouble is quite as likely to be found in your wiring, battery connections, etc., as in the burner; if, however, the burner should be found to be defective from any cause, we prefer that same be returned to us than to attempt repairing or re-adjusting it.

Price, each, . . . . . \$6.00

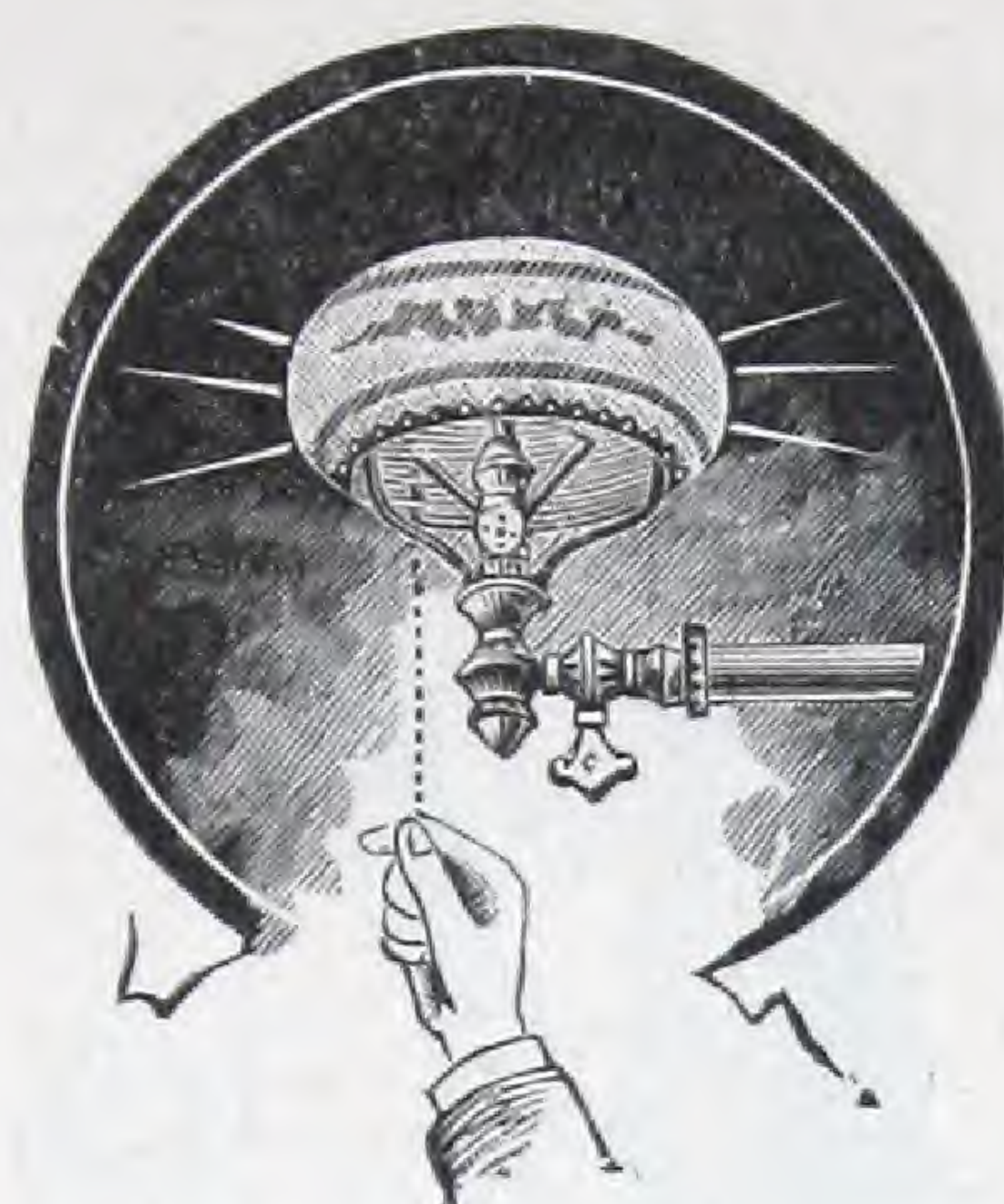
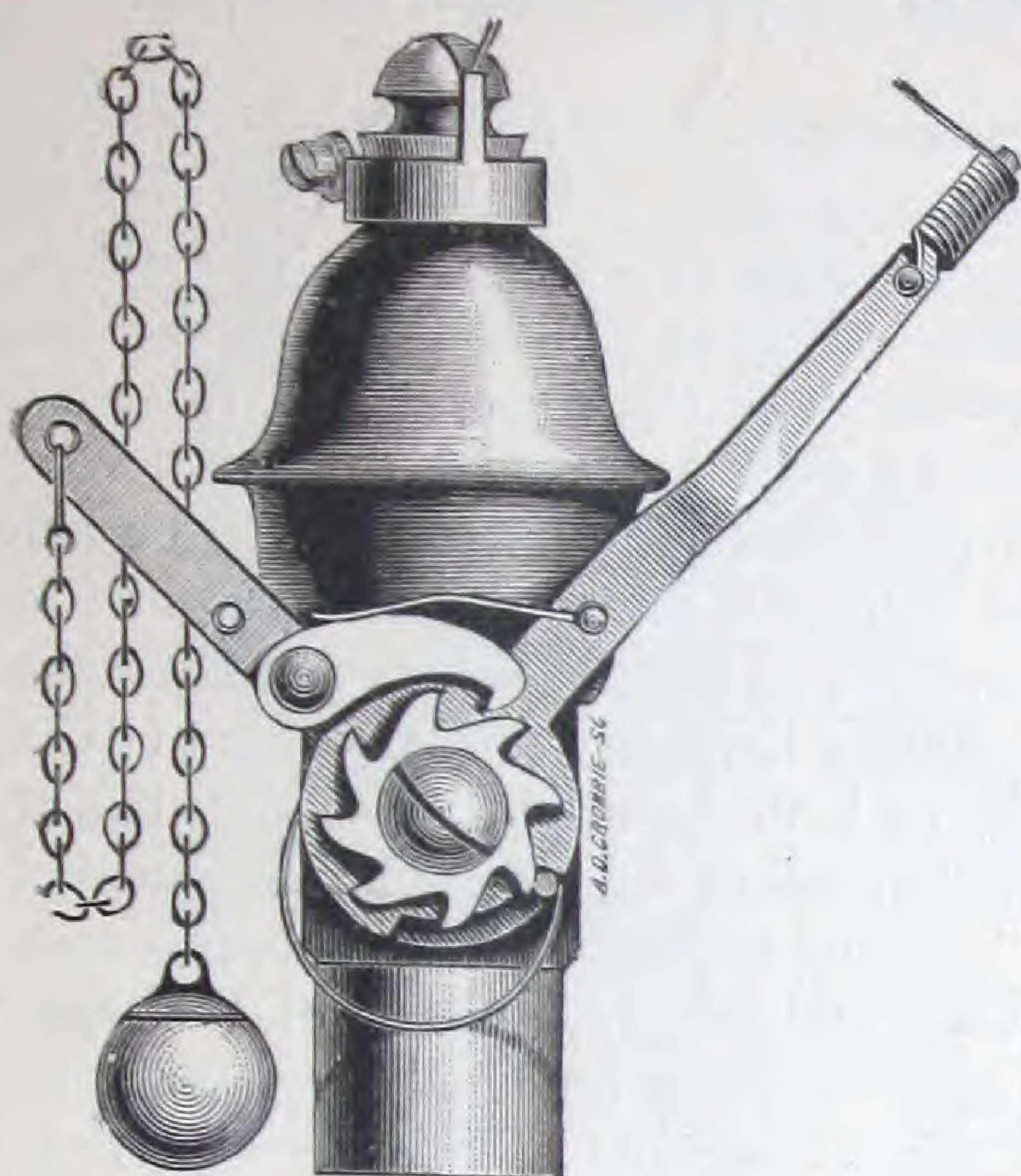
Liberal Discount to the Trade.



## ELECTRIC GAS LIGHTING—Continued.

### RATCHET PENDANT BURNER.

THE BEST.



OPERATION.

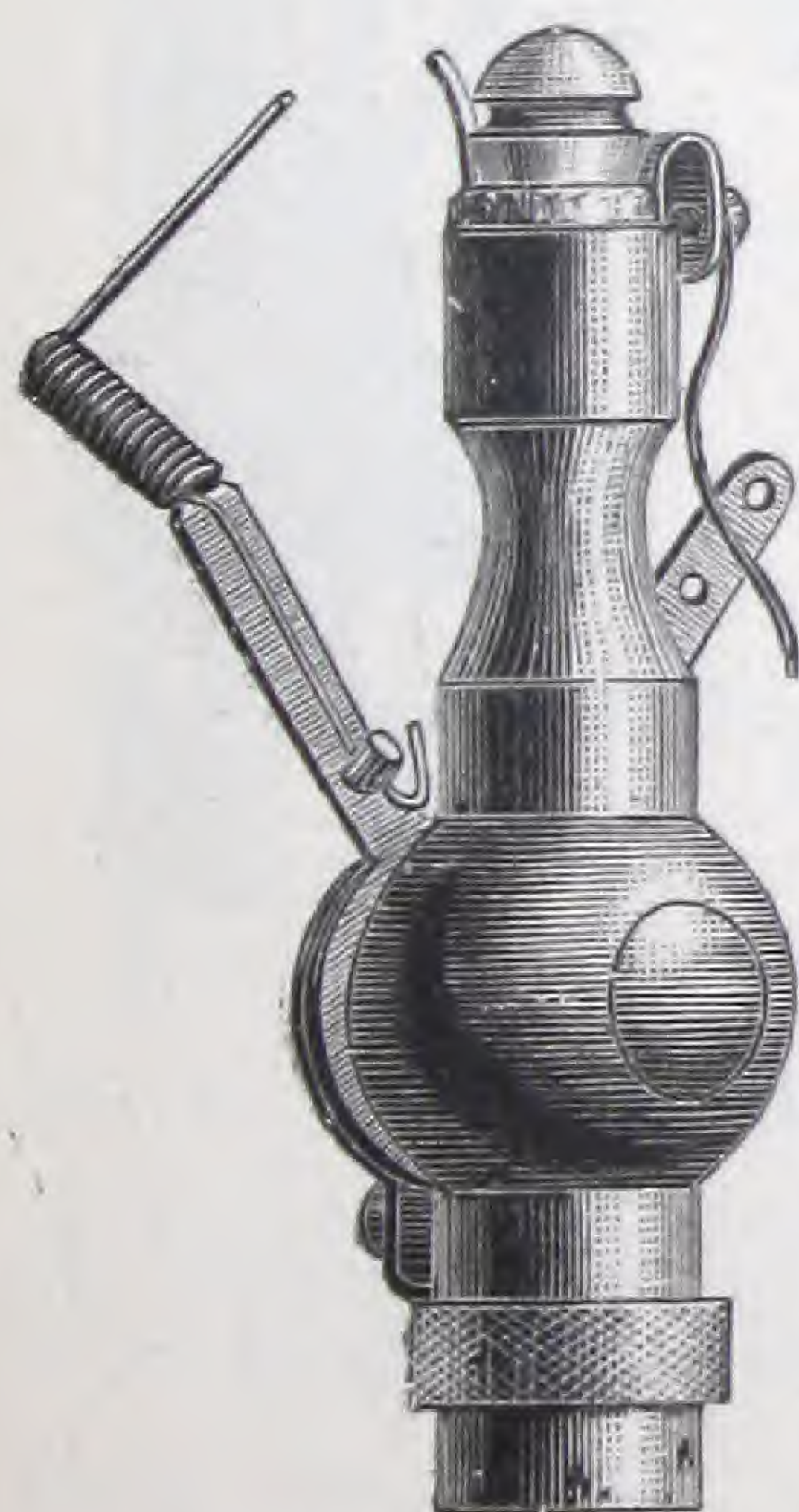
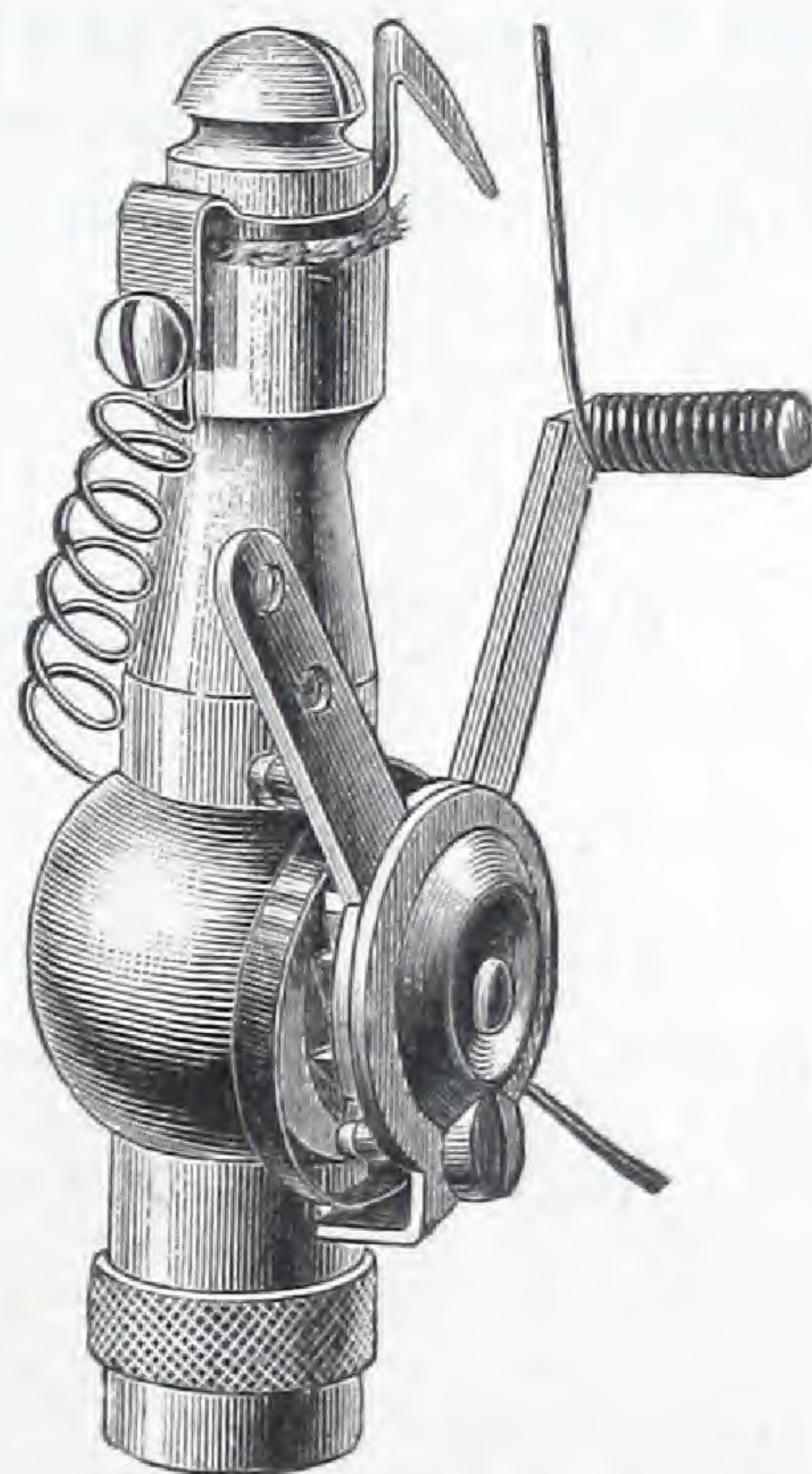
The first pull of the chain turns on the gas through a four-way gas-cock governed by a ratchet wheel and pawl. The issuing gas is lighted by a wipe spark at the tip of the burner. Alternate pulls turn off the gas.

Price, each, . . . . . \$1.25

### TIP-TOP RATCHET BURNER.

Differs materially in construction from the above ; but is operated by means of a pending chain in same way. It is a remarkably simple and easy working burner.

Price, each, . . . . . \$1.25



### THE IMPROVED CONTACT RATCHET BURNER.

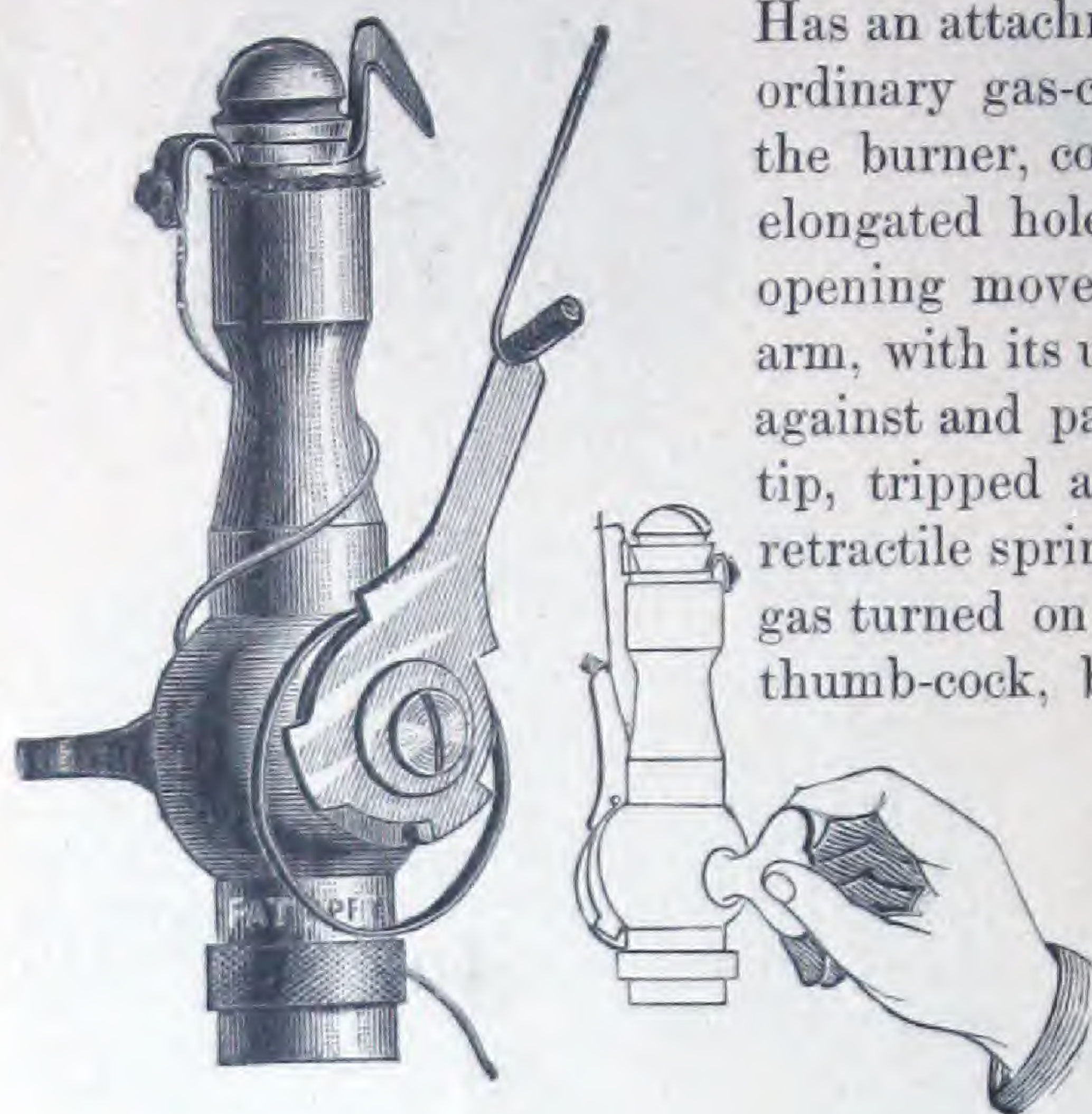
Is made after the same design as the Tip-Top Ratchet Burner ; though differing in the manner of forming contact, the operation is the same.

Price, . . . . . \$1.25



## ELECTRIC GAS LIGHTING—Continued.

### THE NEW THUMB-COCK BURNER



Has an attachment fixed upon the small end of an ordinary gas-cock, which is located in the base of the burner, consisting of a vibrating arm with an elongated hole, tripping pin and cam. By the opening movement of the gas-cock the vibrating arm, with its upright elastic contact point, is forced against and past the fixed electrode at the burner tip, tripped and then returned by means of the retractile spring to its normal position, leaving the gas turned on and lighted. A quarter turn of the thumb-cock, back to its original position, extinguishes the gas. The construction and operation of this burner is such that short-circuiting of the electrodes is rendered impossible by ordinary use. It is more particularly designed for factories, shops, or other places where globes are

not in vogue, yet it may be conveniently used where the base opening of the globe is large and within easy reach. The thumb-cock burner is a novel and substantial improvement in electric hand-lighting devices.

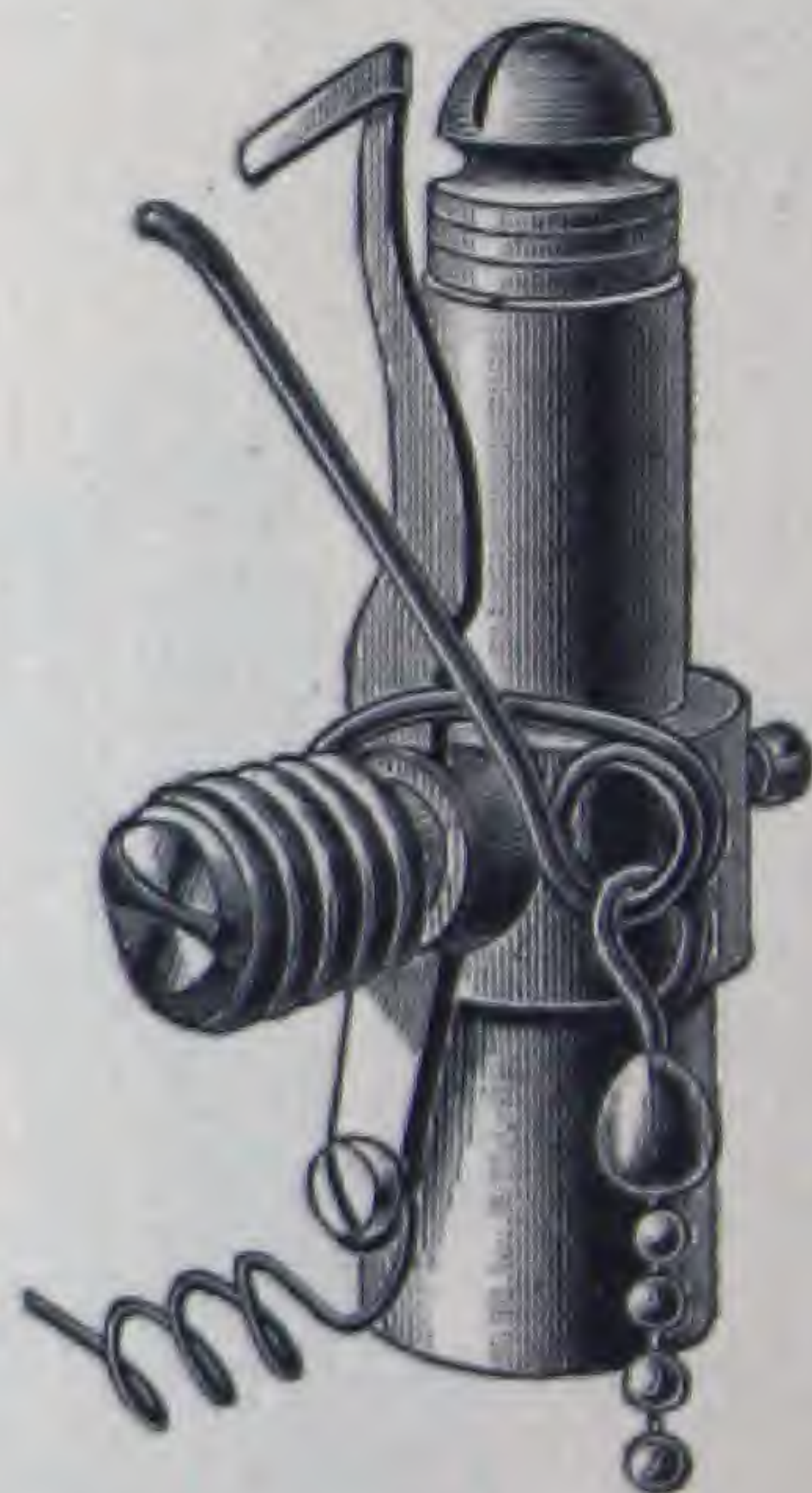
Price, each, . . . . . \$1.50.

### THE SIMPLE FACTORY HAND-LIGHTER.

Operated by pulling the chain after the gas has been turned on by the thumb-cock.

Adapted for use in workshops and factories.

Price, each, . . . . . 45 cts.

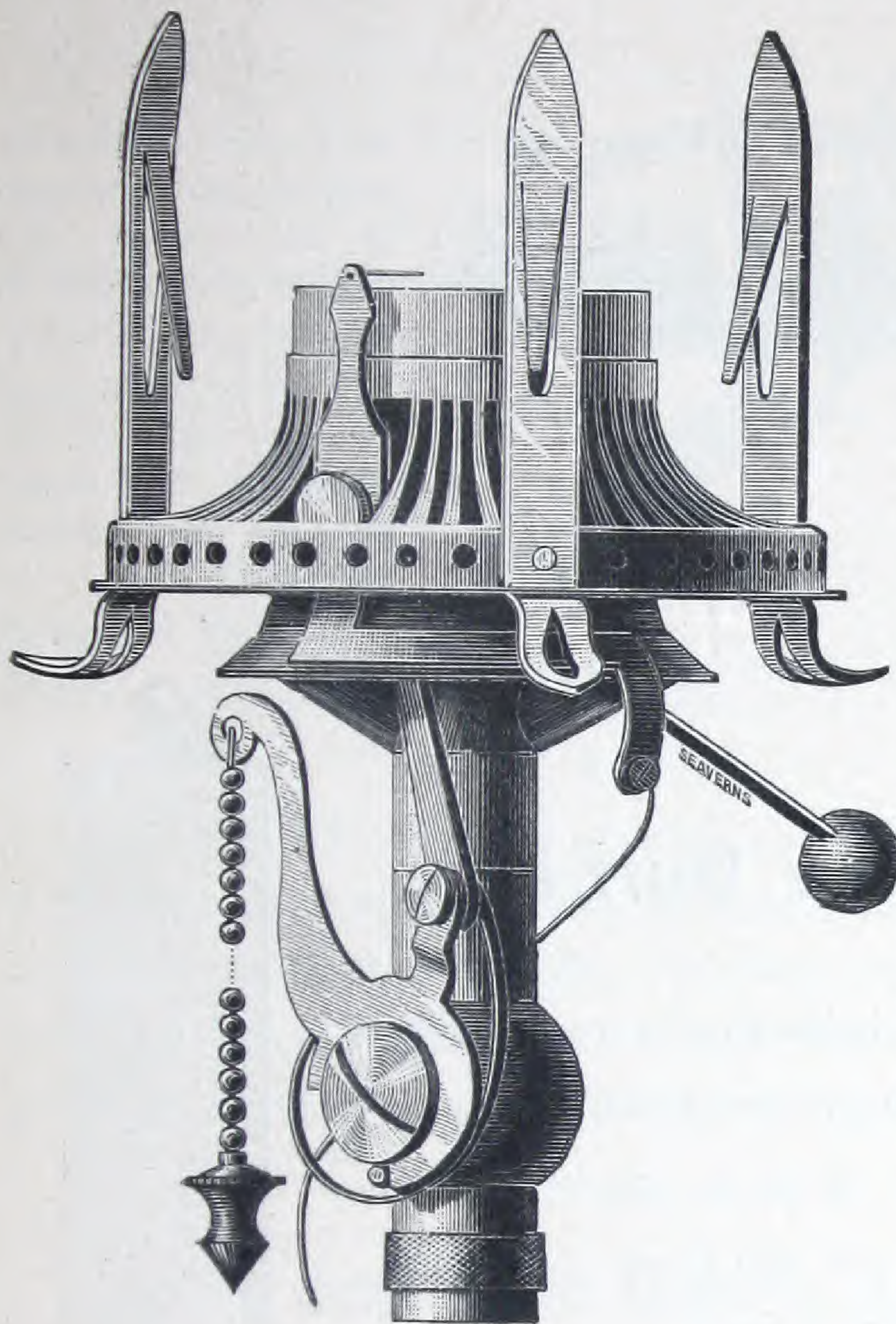


### THE VIBRATING LIGHTER AND BURNER

Does away with chain, ratchet-wheel and pawl, and is operated by turning the gas-cock in the fixture, and simultaneously pressing a button placed near by.

Price, each, . . . . . \$2.00.



**ELECTRIC GAS LIGHTING—Continued.****THE SIMPLE ARGAND LIGHTER.**

The latest style Argand shade holder and regulator is used upon these burners. The difficulties heretofore experienced in the use of Argands lighted by electricity have been overcome by the practical construction of these burners. They work more satisfactorily than any heretofore devised, and are extensively used.

Price, each, . . . \$2.75

**IMPROVED RATCHET ARGAND BURNER.**

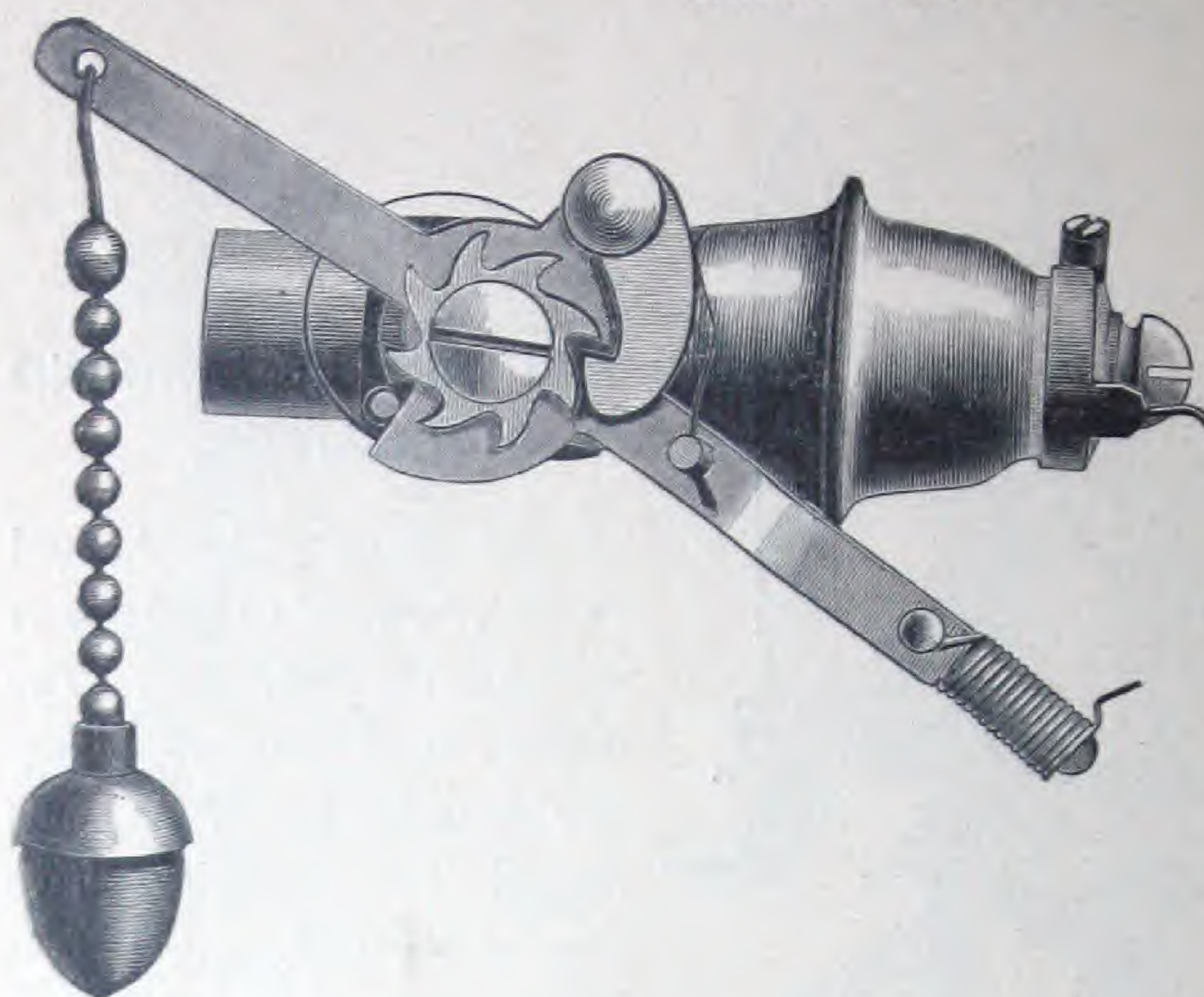
The vibrating arm and manner of insulating is the same as in the above burner. The mechanism, however, employed to rotate the gas-cock is the same as in the Ratchet Pendant Burners, gas being ignited and extinguished by the pulling of an ornamental chain.

Price, each, . . . \$3.25



## Billiard Table Ratchet Burner.

This is the only Electric Gas Burner suitable for lighting Gas Jets over Billiard Tables.



A simple pull of the pending chain turns the gas on and lights it. A similar pull extinguishes it. Does away with the use of matches and torches. All danger of fires and of damaging tables averted. The saving of gas and other advantages will in a single year go far towards paying the cost.

Price, each, \$1.50

## Ratchet Candle Burner.

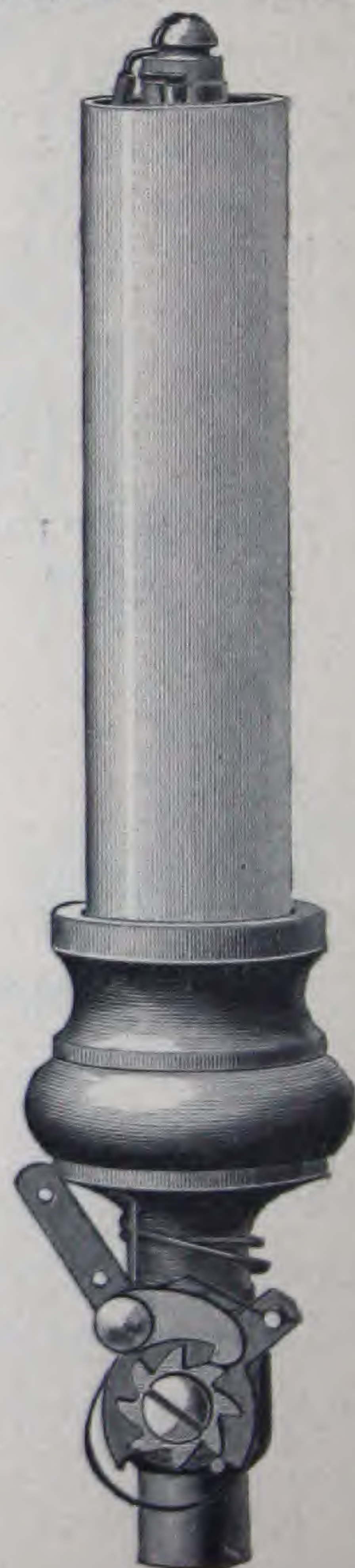
This novel lighter is made in imitation of a sperm candle. It is substantially made, handsome in appearance, and is daily growing in popular favor. It can be attached to any of the various styles of sockets, and will fit any gas fixture. Operated same as the above Billiard Ratchet.

Price, each, \$4.50

## Plain Candle Burner.

Similar to above in appearance, but without ratchet. Gas is turned on by thumb-cock, and ignited by pulling pendant chain.

Price, each, \$3.50

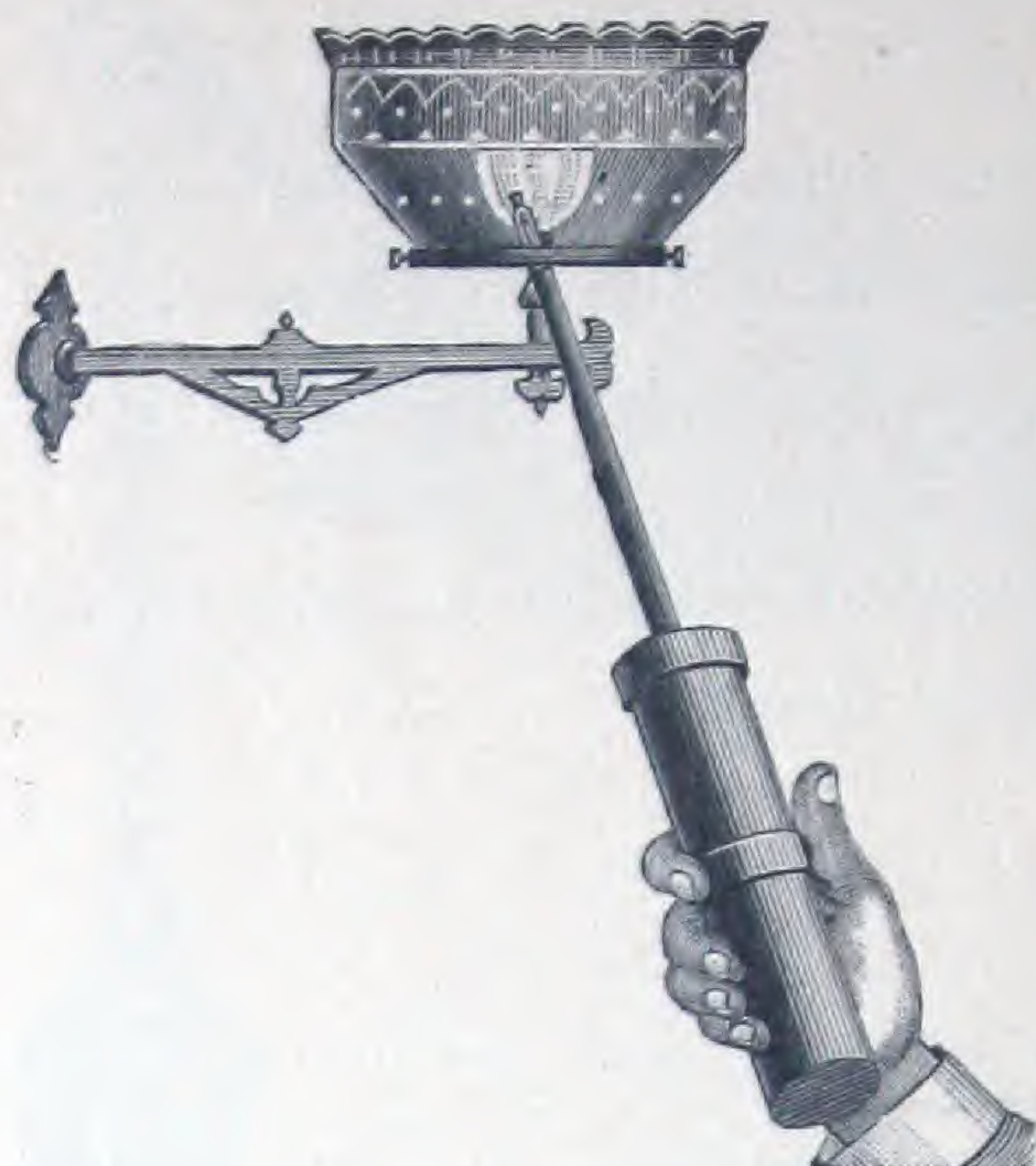








## New Portable Dynamo Gas Lighter.



The Latest Electrical Invention.  
Absolute Safety from Fire.

—  
ALWAYS READY FOR USE.

—  
**NO BATTERY.**

—  
Simple, Reliable, Entirely  
Mechanical.

—  
The gas is turned on by the clutch at the end of the stem. The opening in the stem is then placed about half an inch above the burner. Press the button in the handle, when the spark is thrown to the point and the gas is instantly ignited. This igniter will set fire to nothing but gas. Its use does away with matches, tapers, and alcohol torches, which smoke the globe, soil the fixtures, and occasion frequent fire losses. It is made very neat and attractive, with brass or nickel-plated trimmings.

### PRICES.

	Brass Trimmings.	Nickel-plated Trimmings.
9 Inch Stem.....	\$5.00	\$5.50
15   "   " .....	5.50	6.00
20   "   " .....	6.00	6.50
30   "   " .....	6.50	7.00
36   "   " .....	7.00	7.50
48   "   " .....	8.50	9.00

—  
We are manufacturers' agents for these goods, and shall be pleased to quote special discounts to parties desiring to engage in their sale.



## Electric Gas Lighting Supplies.

### CHAINS AND PULLS FOR HAND-LIGHTING BURNERS.

	Per Yard.
Fancy Bead Chain, Gilt.....	\$ .40
“ “ “ Nickel-plated.....	.50
	Per Dozen.
Cups and Pins for fastening Bead Chain to Burners, Gilt.....	\$ .20
“ “ “ “ “ “ Nickel-plated.....	.25
Acorns for Bead Chains, Gilt.....	.65
“ “ Link “ or Wire, Gilt.....	.65
“ “ Bead “ Nickel-plated.....	.85
“ “ Link “ or Wire, Nickel-plated.....	.85
Glass Balls for use on Crystal Fixtures.....	2.00

### BEAD CHAIN PULLS, COMPLETE.

Length.	Gilt, with Acorn.	Nickel-plated, with Acorn.
3 inch,	\$1.50 per Dozen.	\$1.75 per Dozen.
4 “	1.60 “	1.85 “
6 “	1.75 “	2.00 “
8 “	2.00 “	2.10 “
10 “	2.10 “	2.25 “
12 “	2.25 “	2.35 “
15 “	2.40 “	2.50 “
18 “	2.50 “	2.60 “

Soft Rubber Tubing, inside diameter $\frac{1}{32}$ inch, per foot.....	3 Cts.
“ “ “ “ “ $\frac{1}{16}$ “ “ .....	4 “
“ “ “ “ “ $\frac{1}{8}$ “ “ .....	5 “

Rubber Tape or Piping, in Hanks, per lb.....	\$1.00
“ “ “ “ “ Rolls, each.....	.60

### BUY THE BEST MATERIAL.

Our electrical supplies, herewith listed, are manufactured and selected with special reference to the necessities of Electric Gas Lighting business. The wants of our customers in this line will be carefully studied and promptly supplied at as low prices as the same quality of goods can be purchased elsewhere. We think that the margin of profit in this business should be sufficient to admit of the purchase and use of the very best material the market affords.

Give your full address, naming county and State, and instruct us as to route of shipment in case there is a preference.







## ELECTRIC WATCH CLOCKS.

### The E. Howard Electric Watch Clock and Regulator.

This Clock and Register is intended to be used in buildings where watchmen are employed, to guard against *Fire* or *Burglars*, reporting the faithful or unfaithful performance of duty of the watchman in charge of said buildings.

The reputation of the E. HOWARD CLOCK is too well known to make any particular claim here in reference to them ; but we will state that the time-keeping part of this device is made with more than ordinary care. The clock at which the watchman's record is made can be arranged for any number of watchmen's records, it being only limited by the room there may be assigned to it in the office, or room in which it is to be placed.

The record is a permanent one and cannot be erased, inasmuch as it is made by punctures through the recording dial, and can be filed for future reference. This is of considerable importance when considering a reduction in rates of insurance.

The Clock may be placed in the office, or in any building near to or remote from the watchman's duties, two wires only, running from the Clock throughout the building being necessary, for any number of points which the watchman is desired to visit in his tour of duty. A single wire can be used by making a ground connection to each station for a return circuit. A station is placed at every point which you wish the watchman to visit, into which he inserts his key (which fits all stations alike), gives one full turn, after which the station automatically makes the record, and the electric currents are, by contact, allowed to pass through the wire and record the specific number of each—and at the moment he visits it. The record is made on a circular piece of paper. It is not necessary that the boxes or stations shall be visited in any particular order or equal number of times, for the record of each box is given independently of any other, and the route of the watchman may be changed, either in direction, or by shortening or lengthening, and the record tells you the truth of what has been done by the watchman. Should the watchman record at one station one or more times at a visit, the record will show it intelligibly in the morning. The record thus shows the time occupied in making any part of the round, as well as the entire round, and how much time is occupied by the watchman while on duty between the rounds.

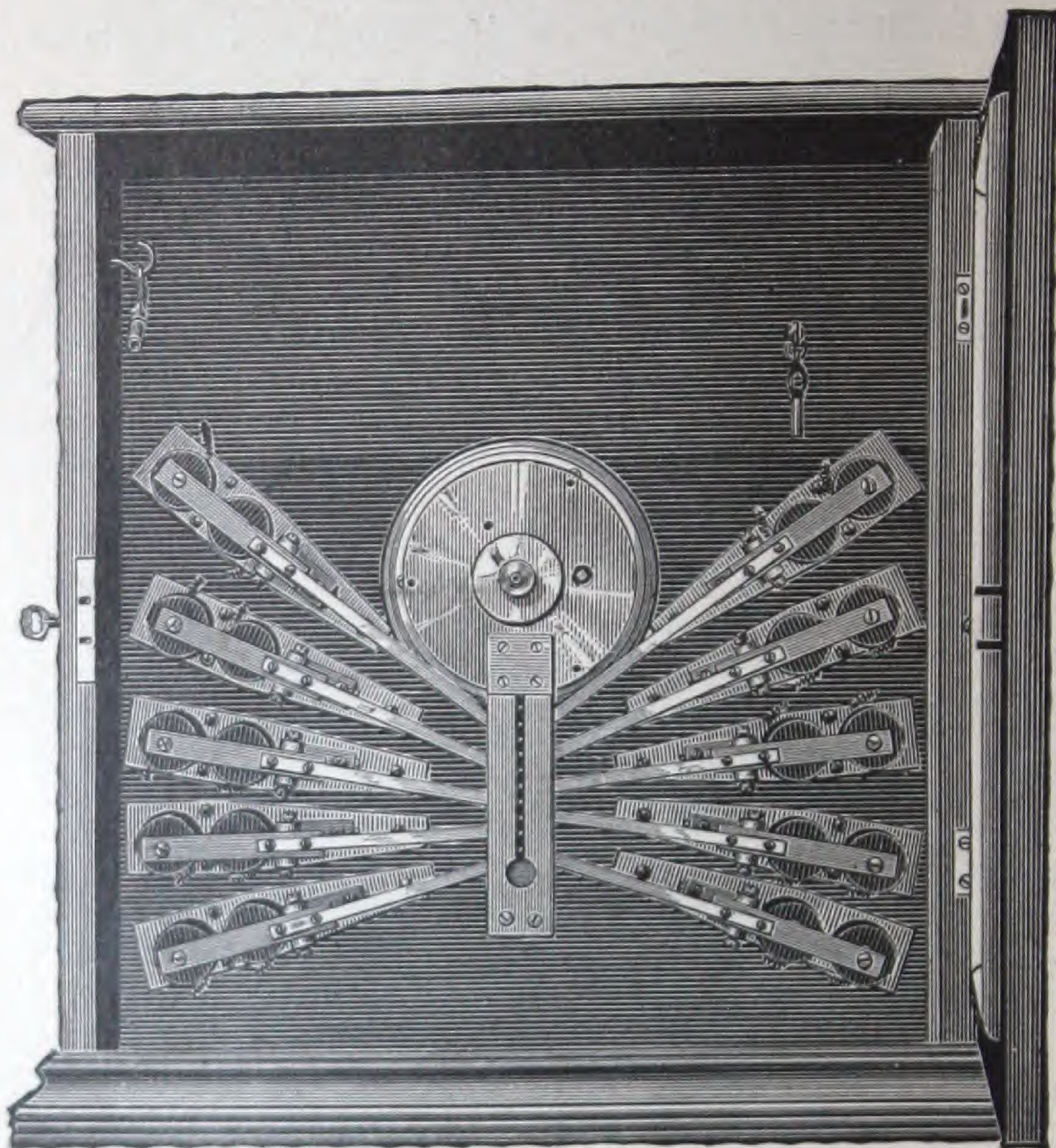
Clock, with Register for 1 Watchman.....	\$150.00
“ “ Registers for 2 Watchmen.....	250.00
Each additional Register, extra.....	75.00
Battery for each Watchman.....	15.00
Stations, each.....	5.00
Door Recorder.....	15.00
A fine Regulator Movement, with full-length pendulum dead-beat escape- ment and maintaining power, is furnished for the additional charge of	50.00

If the Registering Machines are in a plain case without Dial, the price is \$25 less.



## Watchman's Electric Register

For Mills, Public Buildings, and all Localities where Watchmen are employed, for Recording Punctuality and Fidelity, and Registering their Neglect Automatically.



### WATCHMAN'S CLOCK FOR 10 STATIONS.

This Register is for recording the time of a watchman's visit to each locality on his route. It is well adapted to Manufactories, Public Buildings, and all localities where watchmen are employed.

The record, while showing the time at which the visit is made to each station, also indicates the order of the visits, whether made by the regular course or otherwise.

The Register may be located in the office, Superintendent's house, or wherever desirable.

The record is made with a tempered steel point, needs no sharpening or adjusting, and is uniformly distinct and legible.

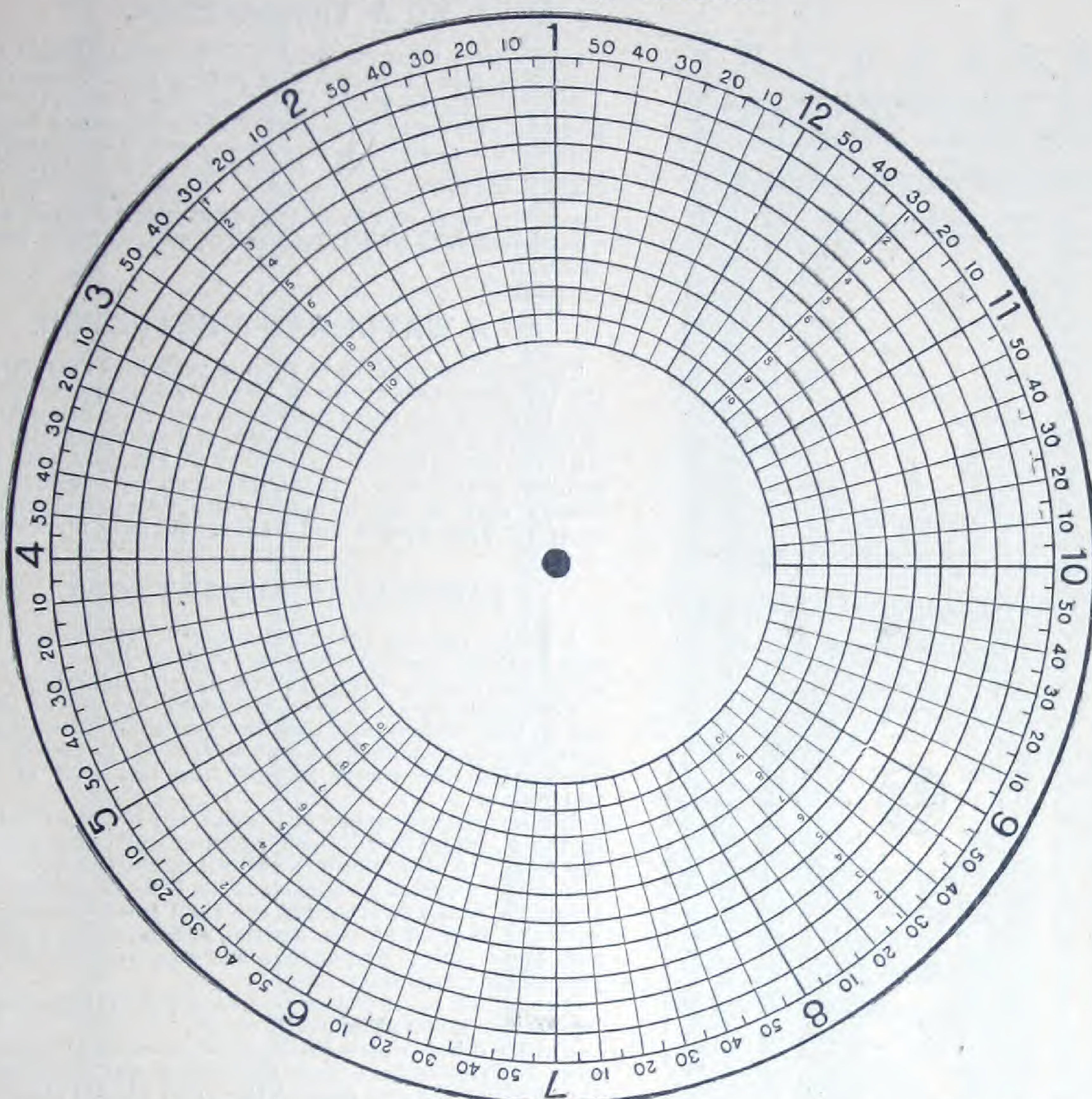
Battery expense is nominal, but three or four cups for a Register.

By the use of this Register, the watchman who does his duty faithfully gets credit for his fidelity.



# RECORD SHEET.

ACTUAL SIZE  $9\frac{3}{4}$  INCHES.



The markers are actuated by an electric magnet, and in each room to be visited is an electric press knob. Upon the watchman pressing this knob, the armature is attracted, which causes a dot to be imprinted upon one of the squares, showing the time and station which is visited.

The Clock and sheet are beyond the reach of the watchman, and are locked up in the office (or where desired). The record is replaced each morning by a clean sheet.

The record cannot be effaced, the paper being punctured at each pressure, tells the story of each visit in its order. Should the watchman fail to make his visits at the proper time, the fact is made *prominent* upon the registering sheet.

Remember, that by using this apparatus, an intelligent account of the watchman's movements during the night are obtainable, and full credit will be allowed him for attention to duty, if the sheet shows the punctures in their proper and *intended* order.

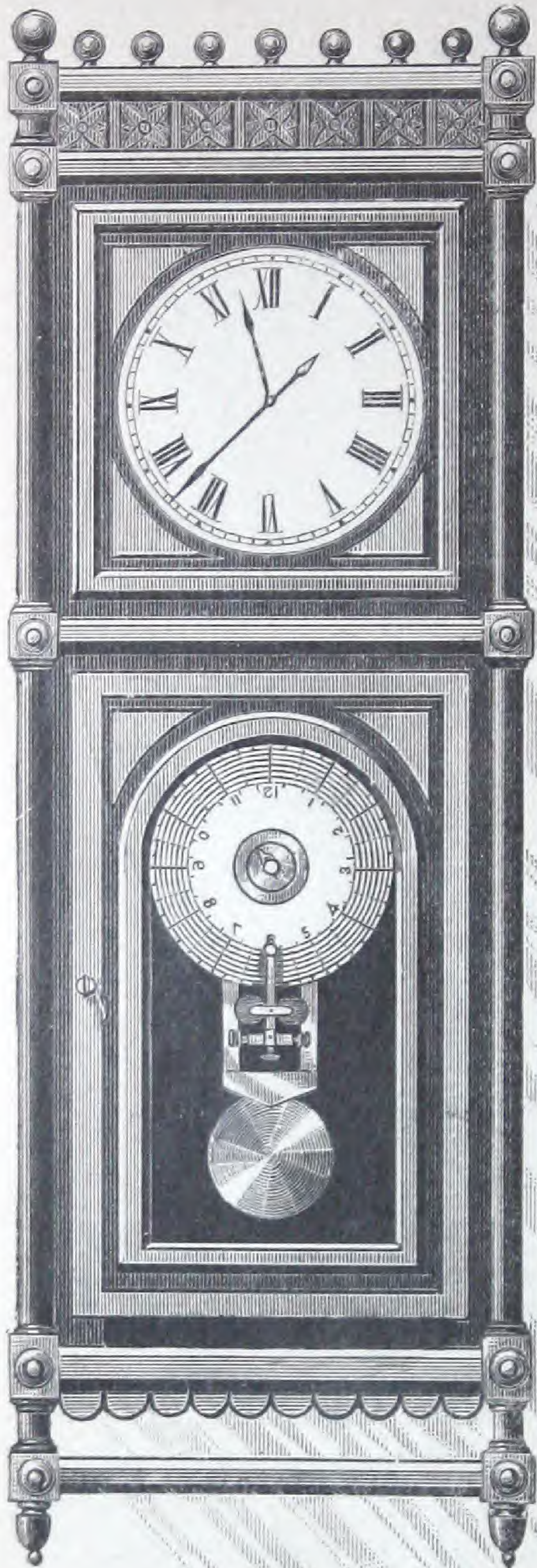
Price, Register for 4 stations,	\$60.00	Price, Register for 16 stations,	\$140.00
" " " 6 "	70.00	" " " 18 "	150.00
" " " 8 "	80.00	" " " 20 "	160.00
" " " 10 "	90.00	" " " 25 "	225.00
" " " 12 "	120.00	" " " 30 "	150.00
" " " 14 "	130.00	Battery (4 cells) complete,	5.00

Labor, etc., putting same in operation, extra.

We should be pleased to submit estimates for supplying the Register, and causing same to be placed in full operation by experienced workmen in our employ.



## Regulator and Watchman's Electric Clock.



### AS A TIME-KEEPER.

Every part being made with the greatest care and exactness, it is naturally more perfect in time-keeping qualities. All the works being enclosed in a heavy solid case—also perfectly made and fitted—becomes a highly ornamental addition to an office; perfect time-keeping is guaranteed. Winds every eight days; height 63 inches; dial 12 inches diameter. Unless otherwise ordered, the cases will be furnished in black walnut, with a handsome dead finish; mahogany, ash, or other woods to order.

### AS A WATCHMAN'S DETECTOR.

The experience of more than a year has determined the value and perfectness of the electrical apparatus, as also its simplicity and superiority over any other kind. Is furnished with 50 dials, which is a year's supply, and with ten signal stations, a battery of six jars, and five hundred feet of wire. It is only necessary to attach the circuit wire to the terminals, and this combined and complete Time-keeper and Detector is ready for work.

### PARTICULAR ADVANTAGES.

A double registry of the watchman's visit to each station, both at the station itself and on the dial at the clock, one registry being a check against the other.

The registration boxes or stations are made of thick metal, with arched tops, and the registry at the stations being entirely independent of the clock, in case of fire the station box would indicate the last visit of the watchman.

If the wires are tapped or broken, the boxes, if visited by the watchman, will also register independently of the clock; in other clocks a skillful manipulator of the wires will register at the clock as if from regular stations. In this, the record at the clock must correspond with the register at the station, and any discrepancy indicates a lack of proper care and watchfulness on the part of the watchman.

The station boxes being numbered, should be visited by the watchman at stated intervals.

Unlike other watch-clock systems—whose performance and registration cease entirely on any stoppage of the clock—if, by any chance, the clock should stop, and the watchman visit each station as usual, the boxes would continue to register regularly.

Our clock will record the visits of the watchman for seven days without any attention or change of the registration dial. Others require to be changed each day.

We recommend two wires, or a metallic circuit, as being less liable to accident or interference than a single wire; and we claim especially, as an advantage over any other watch clock, the changing promptly at 12 o'clock noon. It is not liable to get out of order, which is the reverse of other clocks for this purpose, and finally, this is **AN EIGHT-DAY WATCHMAN'S REGISTER**, as the register is run on the main works, the time attachment being separate and working independently.

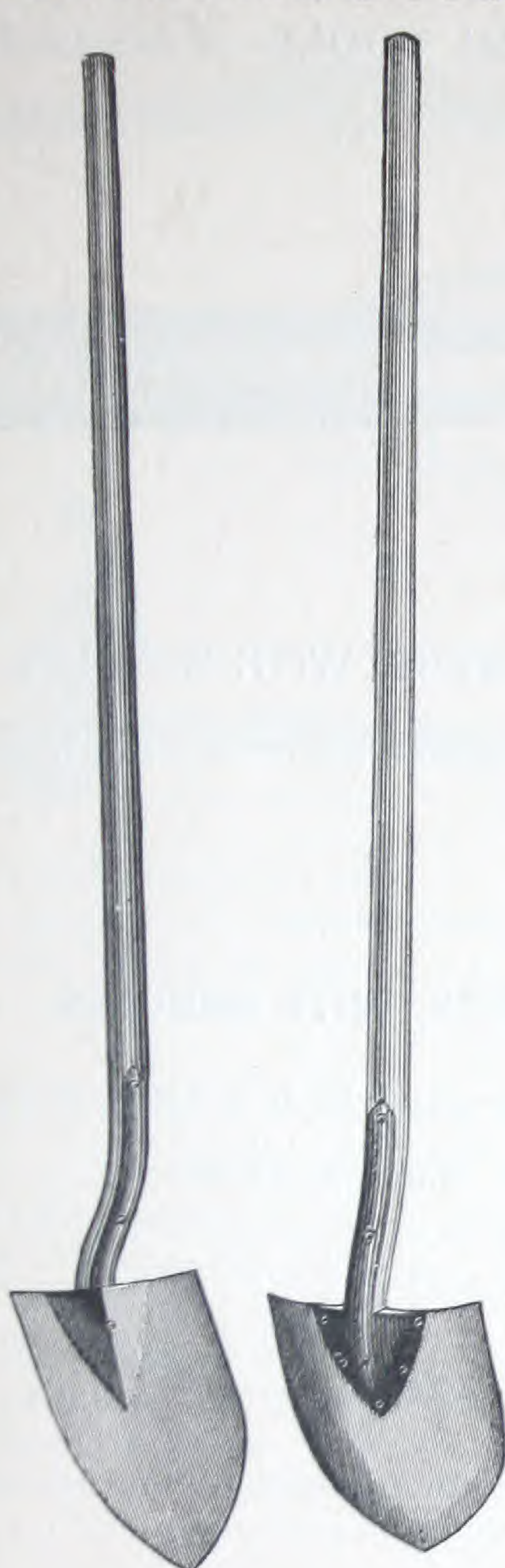
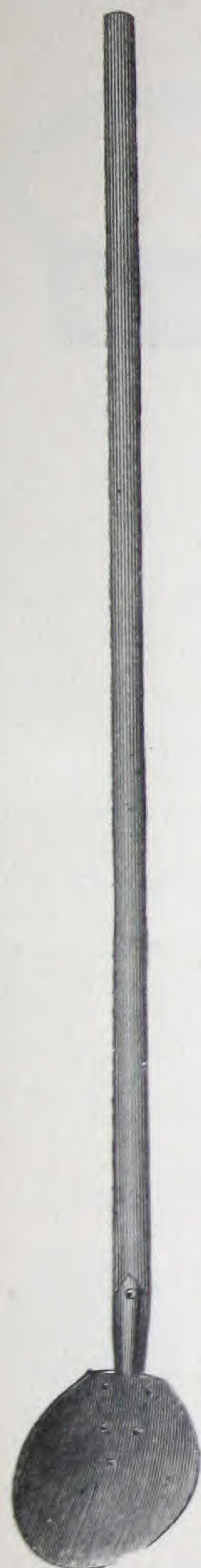
**PRICE, \$150.**

The price of Station Boxes, which may be deducted from the above complete price,

or added if more are required,	\$2.50 each.
Additional, or Extra Batteries,	1.25 "
Additional Underwriters' Wire (inside or outside),	.35 per lb.
Porcelain Insulators,	.10 each.
Corner "	.50 "
Insulated Iron Wire for outside use,	.10 per lb.



# CONSTRUCTION TOOLS.



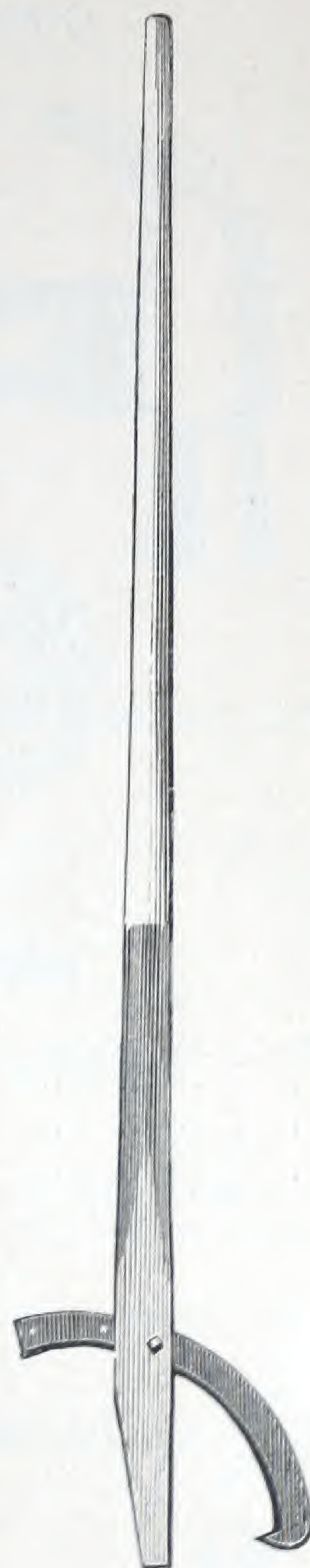
**SHOVELS—7 ft. Handles.**

Per doz., . . . \$9.00  
Extra handles, per doz., 3.00



**DIGGING BARS, Cast Steel.**

Per lb., . . . 11 cts.  
**TAMPING BARS**, per lb., 9 "



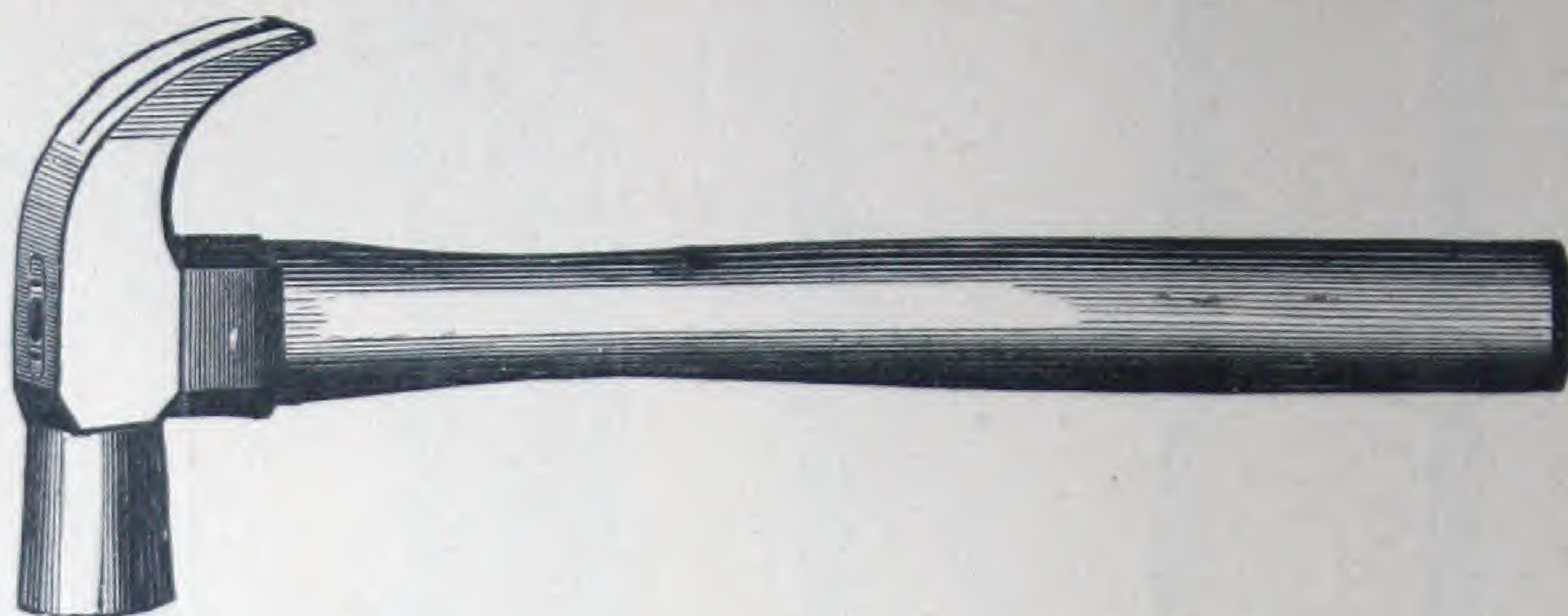
**CANT HOOKS.**

5 ft. Handles.  
Each, . . . \$2.00  
Extra heavy, 2.50

**SPOONS—7 ft. Handles.**

Per doz., . . . \$9.00  
Extra handles, 7 ft. long, per doz., 3.25



**CONSTRUCTION TOOLS—Continued.****ADZE-EYE HAMMERS, WITH HANDLES.**

Price per dozen, No. 1,	\$11.50.....	Weight, 1 lb. 12 oz.
" " " 1½,	11.00.....	" 1 lb. 6 oz.
" " " 2,	9.75.....	" 15 oz.

**BROAD HATCHETS, WITH HANDLES.**

No. 3, 4½ inch cut, per doz.....	\$ 8.50
" 4, 5 " " " .....	9.00
" 5, 5½ " " " .....	10.50
" 6, 6 " " " .....	12.50

**AXES.**

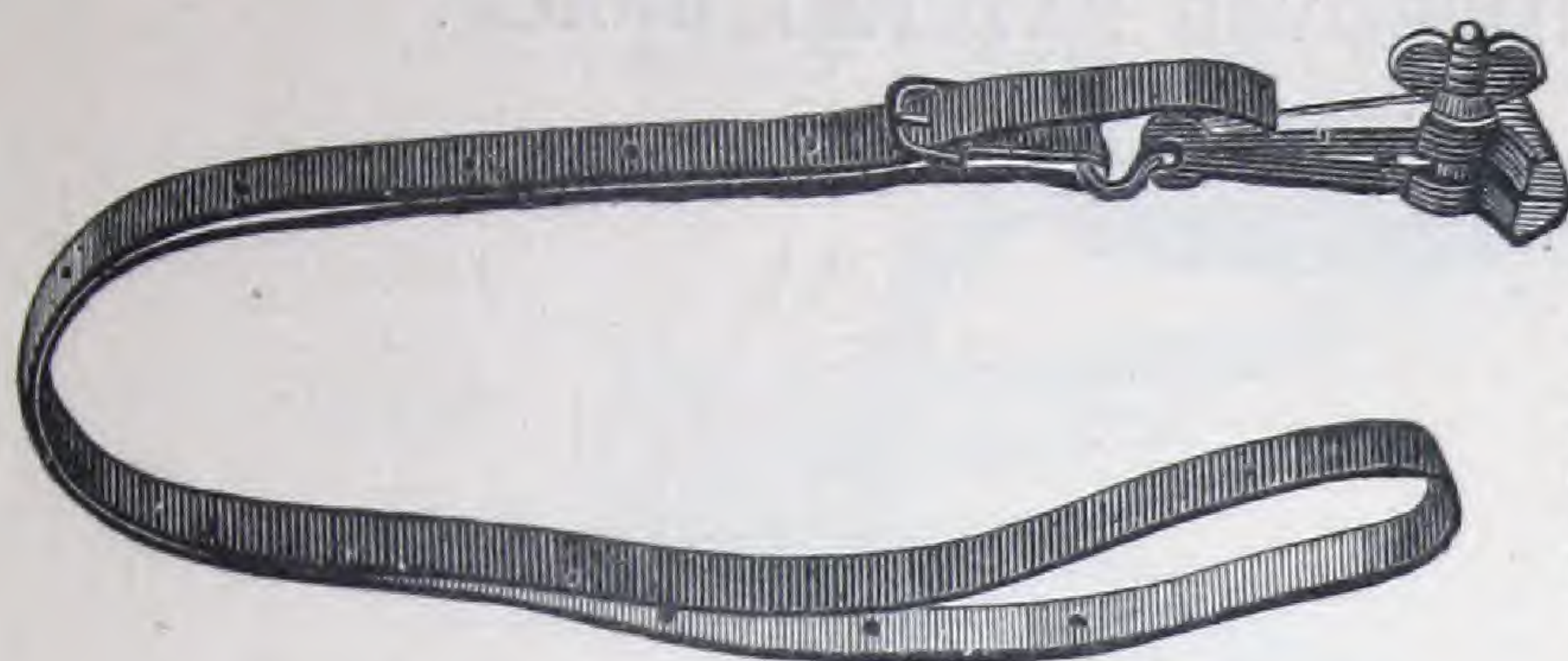
No. 1, with Handles, each \$1.25.....	\$12.50 per doz.
No. 2, " " " 1.15.....	12.00 "

**HEAVY DRAWING KNIVES.**

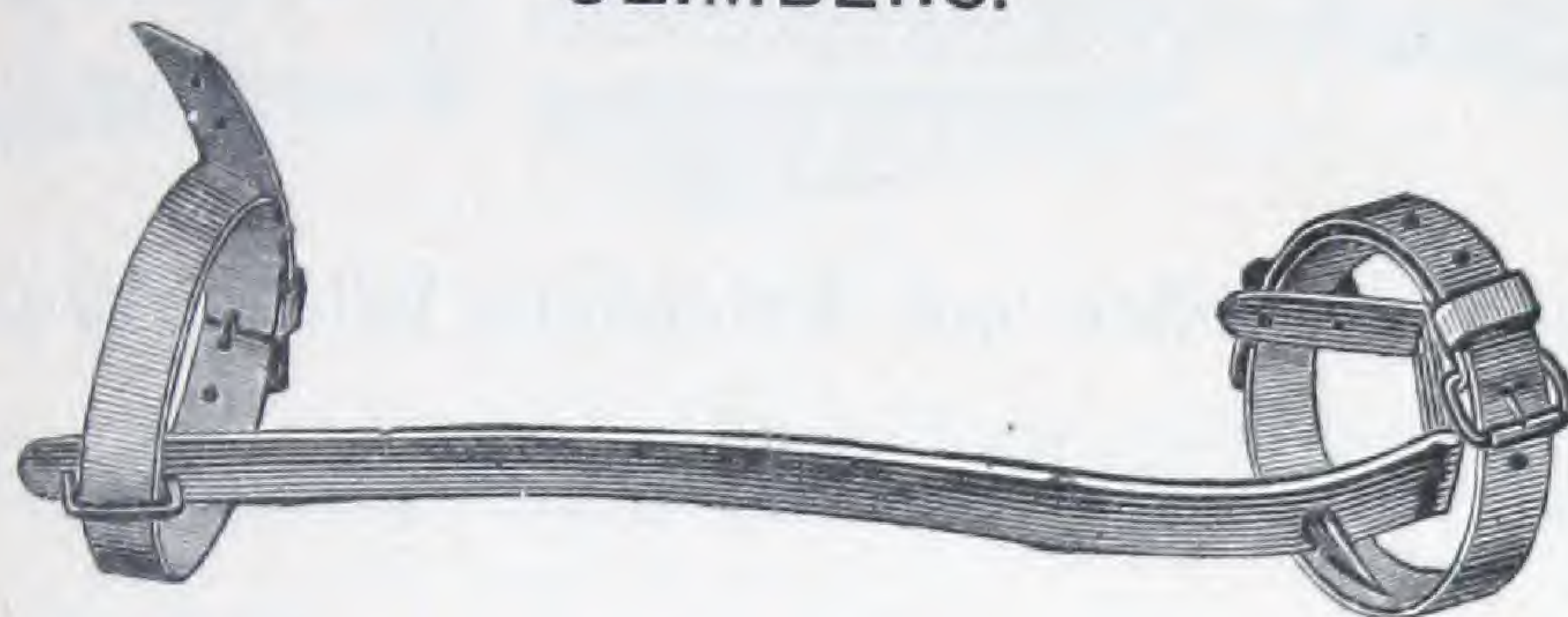
**For Pole Dressing. Ground and Sharpened Ready for Use.**

10 inch, per dozen.....	\$18.00
11 " " .....	19.80
12 " " .....	22.00
13 " " .....	23.50
14 " " .....	25.50
15 " " .....	27.00



**CONSTRUCTION TOOLS—Continued.**

Stub's Vises, with loop for strap.....	\$2.00
Stub's Vises, with strap	3.00
Vise Straps, each.....	1.00
Leather Tool Bags, each	3.50
Tool Belts.....	1.20
Body Belts.....	1.25

**CLIMBERS.**

Climbers—No. 1, with Straps, per pair.....	\$2.75
Climber Straps, per set.....	1.25
Climbers—Western Pattern, per pair.....	2.75
Straps for same.....	1.25

**FETTER DRIVE SCREWS AND POLE STEPS.****DRIVE WITHOUT BORING.**

*Cheaper and Stronger* than lag screws, and will more than save their entire cost in time and labor. They are the only screws that will hold in any wood in warm climates.

Present price, Drive Screws.....	per lb.	.06
“ “ Galvanized Pole Steps.....	“	.07 $\frac{3}{4}$
“ “ Black Pole Steps.....	“	.06

Washers included. Prices subject to change without notice.

**PULLEYS.**

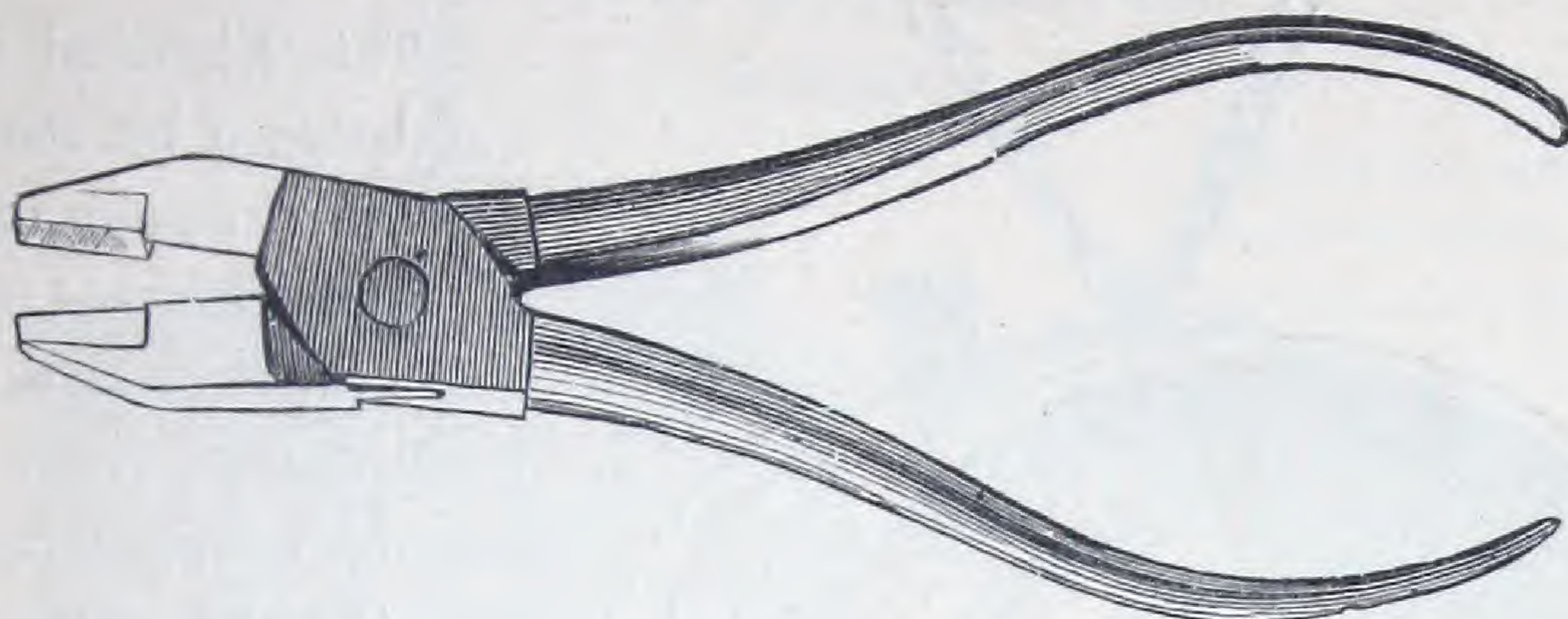
Double, with Hook.....	\$ .75
Single, “ “ .....	.50
Rope, $\frac{3}{4}$ inch Manilla, in 60 ft. lengths.....	.50
Pulleys and Tackle complete.....	1.75







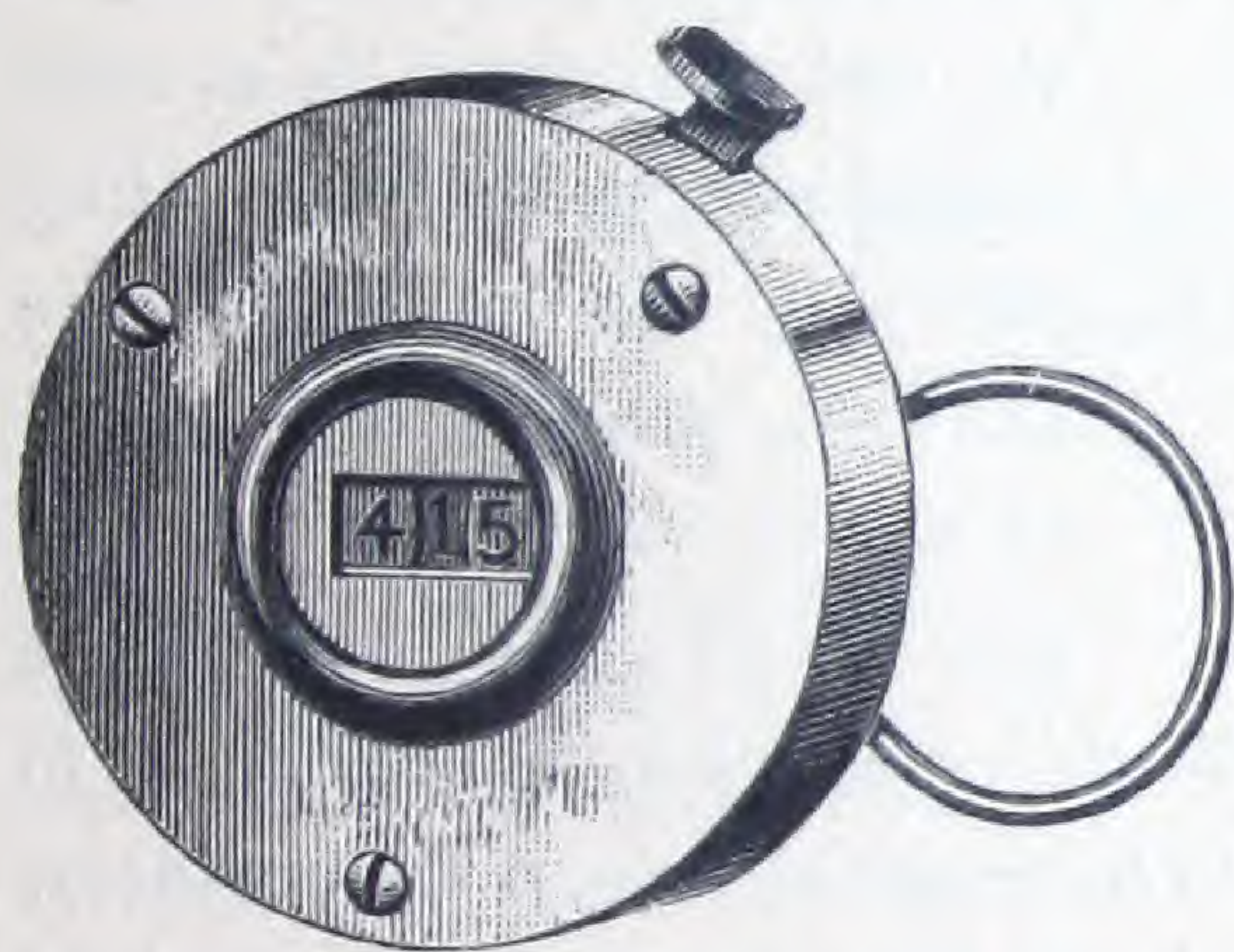


**CONSTRUCTION TOOLS—Continued.****STUB'S SIDE-CUTTING PLIERS.**

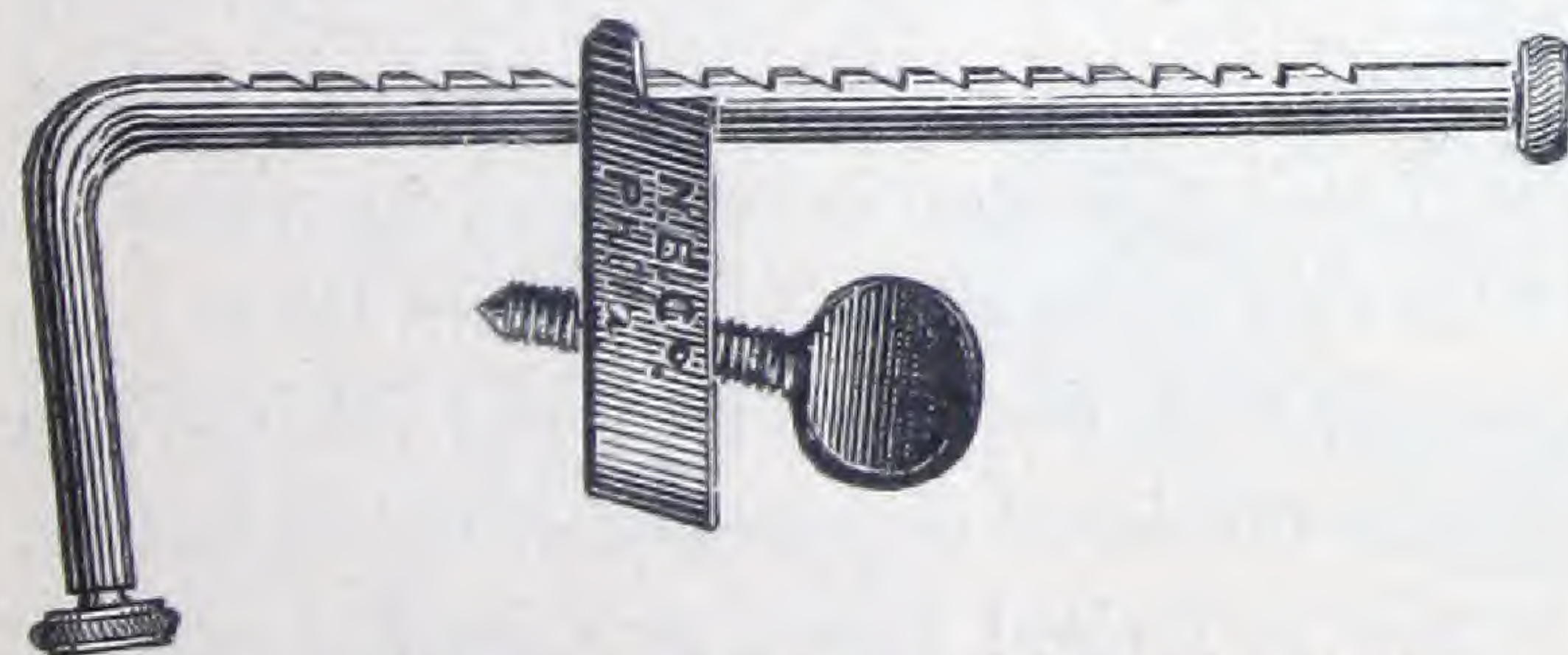
Price, 5 inch, per dozen.....	\$10.00	Nickel-plated.....	\$15.00
“ 6 “ “ “ .....	11.00	“ “ .....	16.50
“ 7 “ “ “ .....	18.00	“ “ .....	25.00
“ 8 “ “ “ .....	24.00	“ “ .....	30.00

**IMITATION STUB'S SIDE-CUTTING PLIERS.**

Price, 6 inch, per dozen.....	\$ 8.00
“ 7 “ “ “ .....	10.00
“ 8 “ “ “ .....	12.00

**Improved Counting Machine.**

For keeping tally of any kind, such as counting poles, broken insulation, making inspection tallies of materials, etc. This instrument is about the size of a watch. Carried in the hand, a single pressure upon the spring records one, and so on up to 1,000. It is a very useful appliance for Superintendents, Telegraph Inspectors, and others connected with Telegraph Construction and repair work.

**LINEMEN'S GROUND CLAMP.**

A very useful tool for every one engaged in running wires for electrical purposes.

We designed this Clamp for the use of one of our railroad customers.

A temporary ground may be easily made by fastening the clamp on a gas or water pipe from

$\frac{3}{8}$  to 2 in. in diameter, or on either the upper or lower side of a T rail.

Price, . . . . . \$1.00



## Electrical Indicator for Steam Vessels.



This Electrical Indicator was designed by the *Novelty Electric Company* on request of prominent vessel owners, to lessen the risks of navigation, resulting from errors in transmitting or receiving signals from the navigating officer to the engineer.

The Indicator is placed in the pilot house, or on the bridge, convenient to the navigating officer.

It is connected by insulated wires with the throttle and reversing gear of the vessel's engines. When the navigating officer signals "*Stop*," the engineer closes the throttle, and this action is at once indicated to the navigating officer by the needle of the Indicator pointing to "*Stop*," as shown in the cut. When the engineer opens the

throttle the needle *at once* points to "*Ahead*," and when he reverses, to "*Back*." The purpose of the Indicator is not to *transmit* signals to the engineer, but to indicate to the navigating officer that his signals have been properly received and obeyed. The Indicator shows this the instant the engineer opens or closes his throttle, or moves his reversing gear, *and before his action has become effective on the motion of the vessel*, thus allowing time to correct an error before it has resulted in a disaster. The device is a new one, but it is already in successful operation on the great lakes, and has secured the favorable notice of the U. S. Navy Dept.

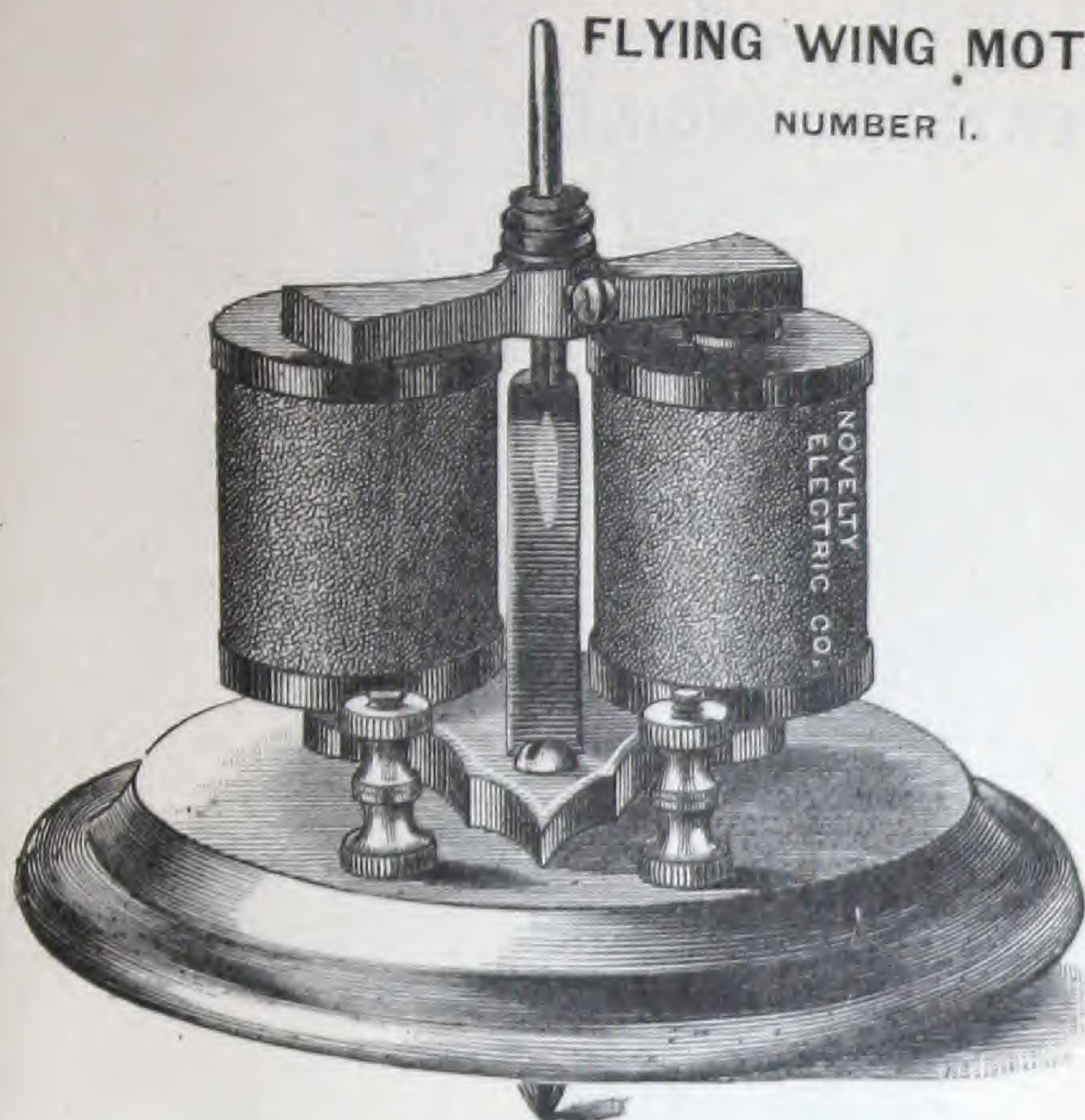
The Price is \$100 for each Indicator, with Switches, Batteries, Wires, and other necessary appurtenances. Estimates furnished for erection of the Indicator, or any other electrical work on any vessels in United States or Canadian waters, or elsewhere.



## ELECTRIC MOTORS.

### FLYING WING MOTOR.

NUMBER 1.



This is the simplest form of motor we make. It is very compact, neat and efficient, and can be used for running small paper figures and light mechanical toys. It can easily be run with one cell of either the Leclanche, Bergmann, or some similar battery. The spindle above the pulley on all our small motors is designed to hold cards, revolving at a high rate of speed, which can be painted while in motion, exhibiting interesting color effects. It packs in a box 4x4x3 $\frac{1}{4}$  inches, and weighs, when packed,  $\frac{3}{4}$  pound.

Price, without battery,	\$1.75
“ with Novelty battery, size “A,”	3.25

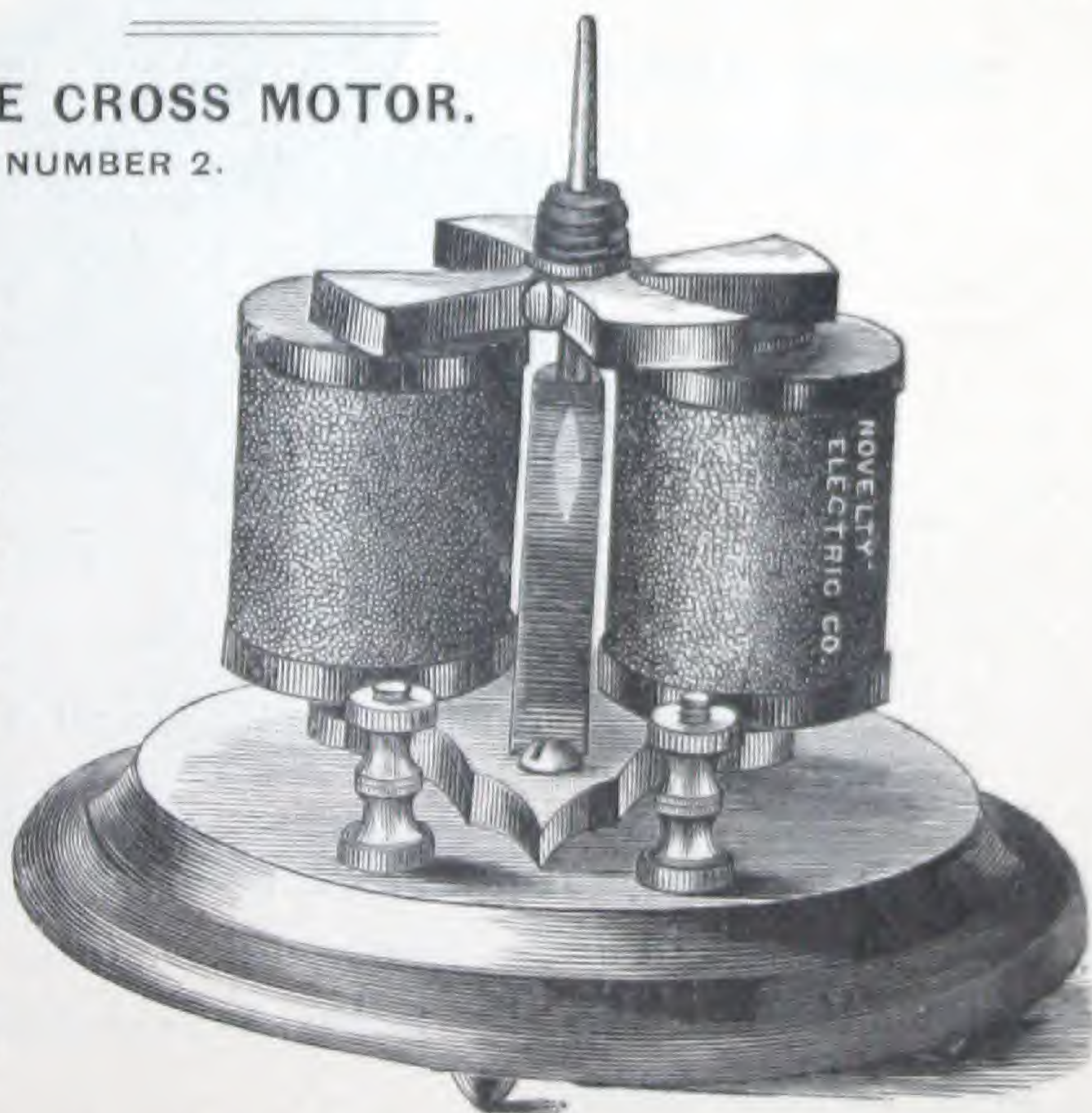
### MALTESE CROSS MOTOR.

NUMBER 2.

This motor is very similar to Number 1, the principal difference being that it has four arms, while Number 1 has but two. It will run on the same battery power, and do more work. Size and weight the same as Number 1.

#### PRICES.

Without battery,	\$2.00
With Novelty battery, size “A,”	3.50

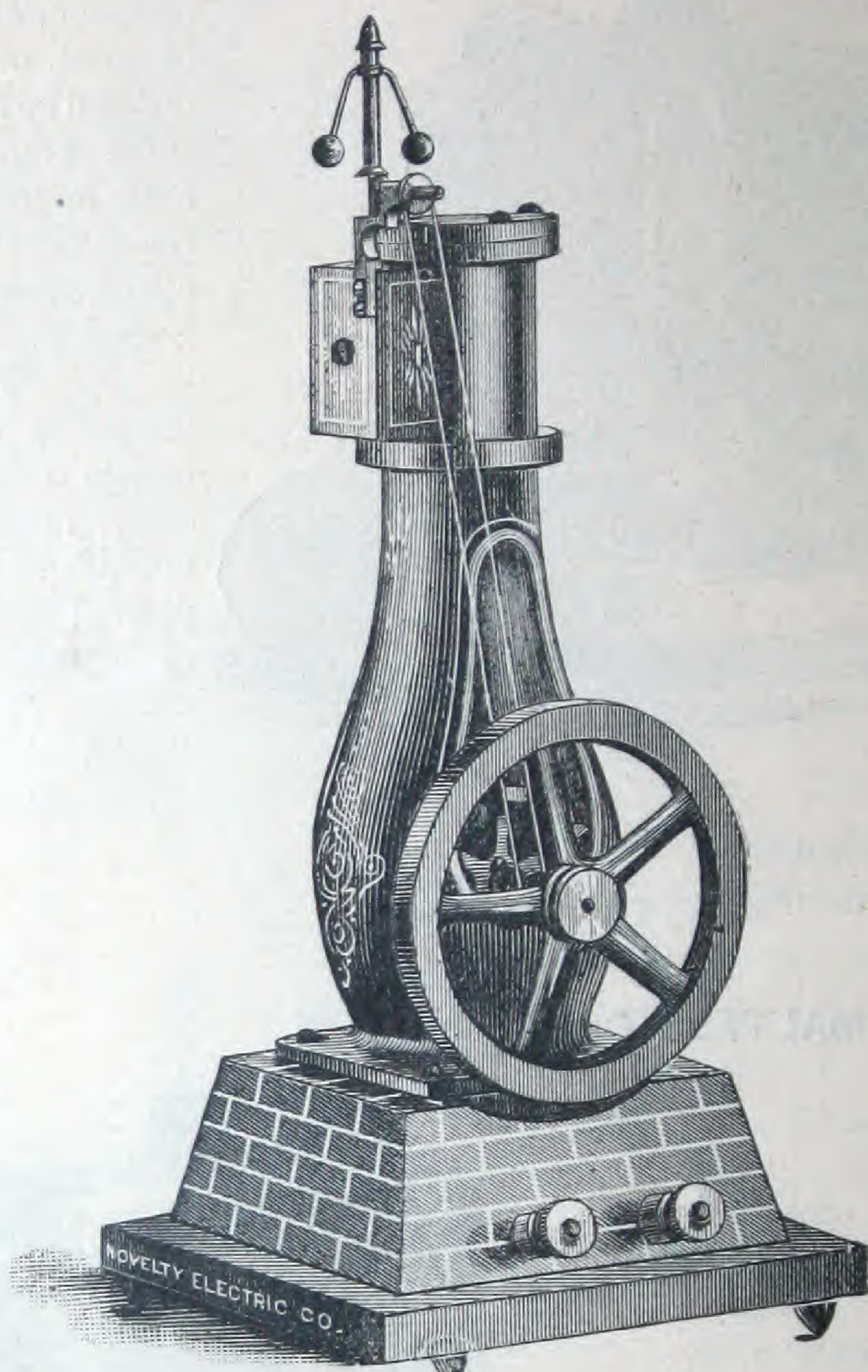


Above cuts are three-quarters actual size.



## ELECTRIC MOTORS—Continued.

## VERTICAL ENGINE.



Number 3.

*Above cut is one-third actual size.*

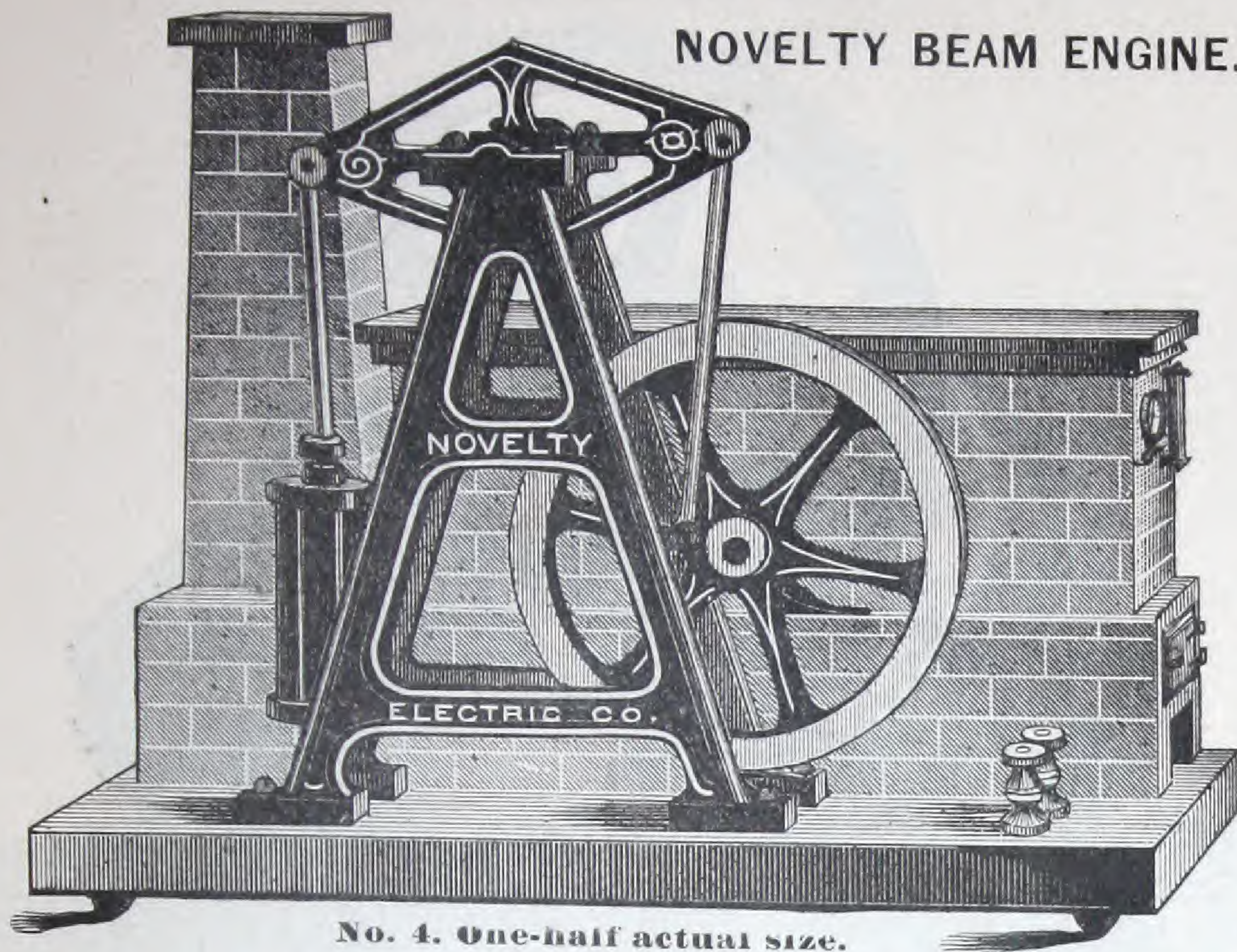
This motor represents a vertical engine. It is well made in every respect, and is a powerful toy motor. It has a brass fly-wheel, 4 inches in diameter, and will run well with one cell of the Novelty battery (page 13). Size, when packed, 6 x 6 x 12½ inches; weight, when packed, five and three-quarter pounds.

Price, (without battery), . . . . .	\$11.50
“ (with Novelty battery, size “A”), . . . . .	13.00



# ELECTRIC MOTORS—Continued.

## NOVELTY BEAM ENGINE.



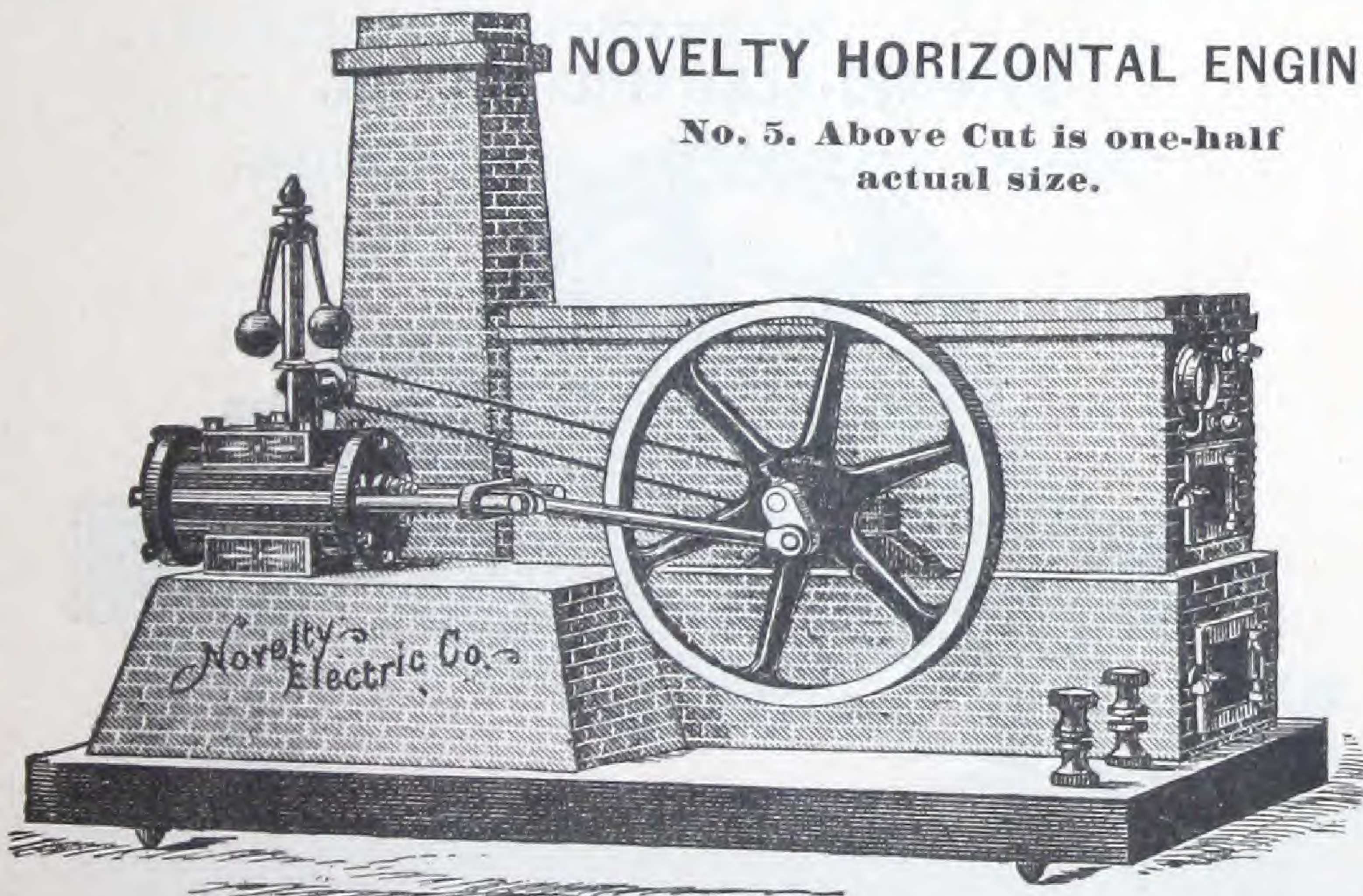
No. 4. One-half actual size.

The above motor represents an ordinary beam engine, with boiler and fire-box enclosed in imitation of brick masonry work. This is a strong motor, but not quite so powerful as No. 3. It runs well with one cell of the Novelty battery. Size, when packed, 9x6x7 inches; weight, when packed, four and three-quarter pounds.

Price, without battery,	\$6.00
“ with Novelty battery, size “A,”	7.50

## NOVELTY HORIZONTAL ENGINE.

No. 5. Above Cut is one-half actual size.

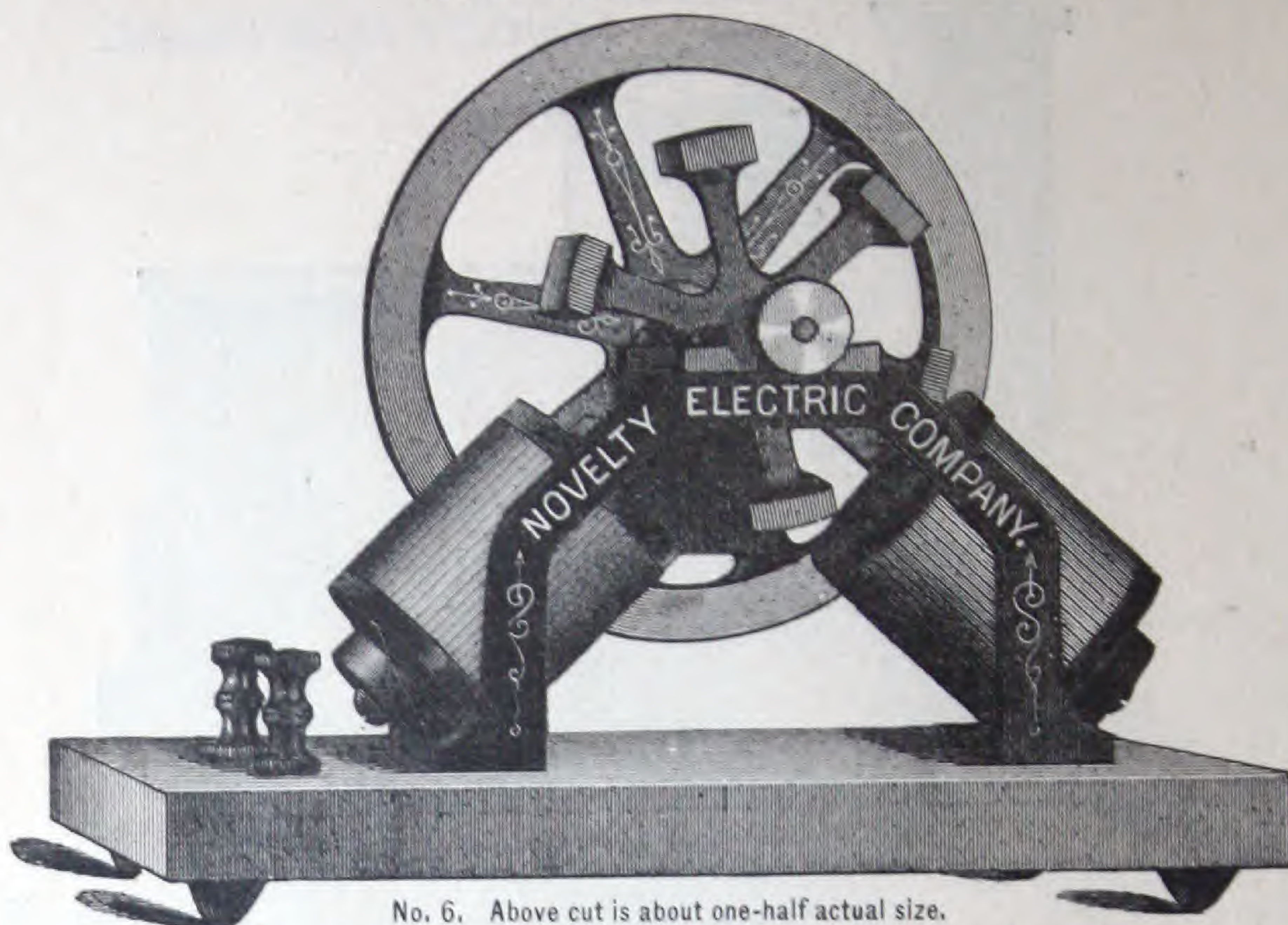


This motor is somewhat similar to No. 4, but represents a horizontal instead of a beam engine. It runs well with one cell of the Novelty battery, and gives the same power as No. 4. The size and weight are also the same.

Price, without battery,	\$5.50
“ with Novelty battery, size “A,”	7.00



## ELECTRIC MOTORS—Continued. RACE HORSE MOTOR.

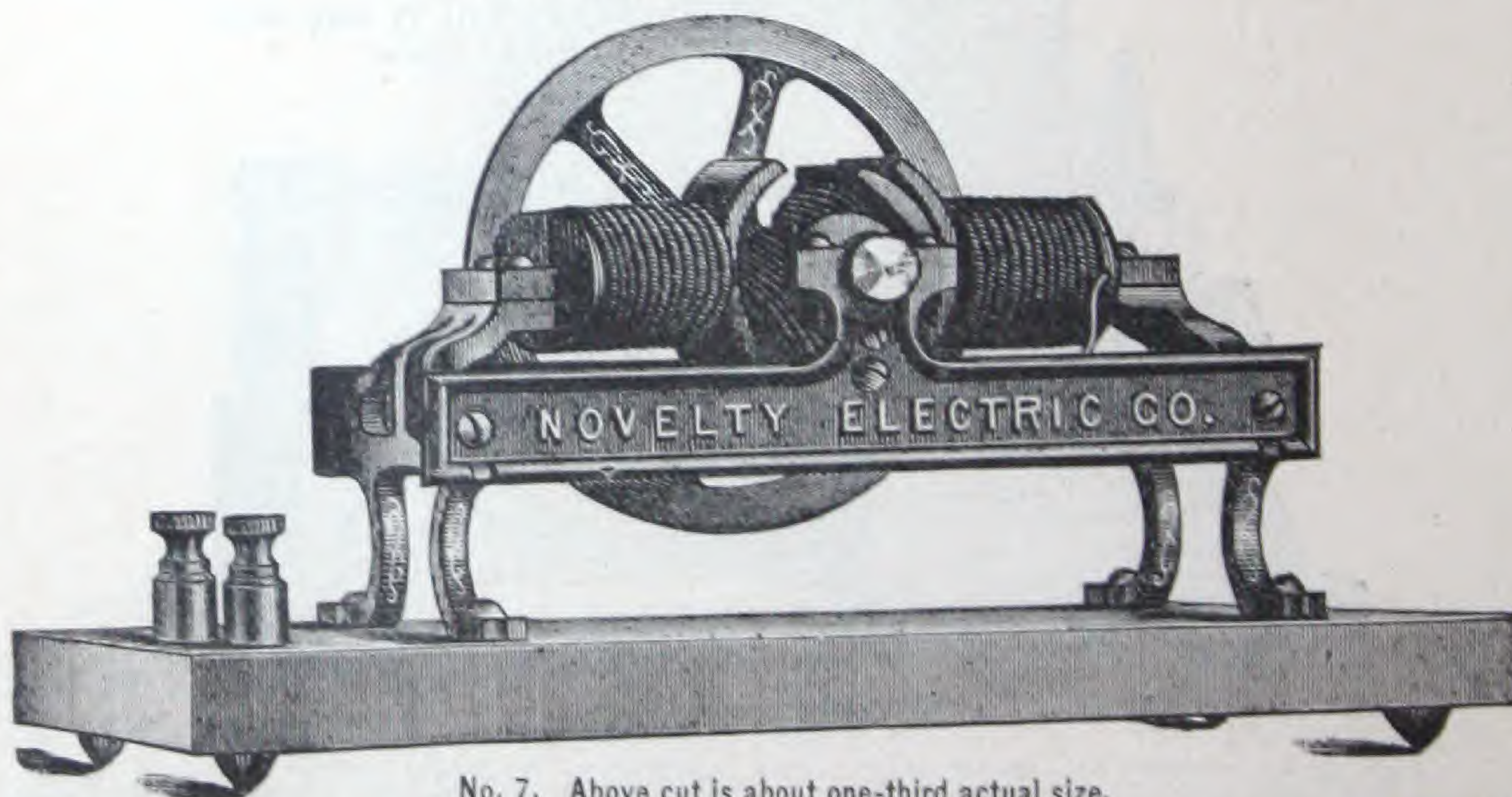


No. 6. Above cut is about one-half actual size.

This motor has a polished brass fly-wheel, three and one-half inches in diameter, on one end of the shaft, and a brass pulley-wheel on the other. It will run very rapidly on one cell of the Novelty battery. Size, packed,  $4\frac{1}{2} \times 6 \times 5$  inches; weight, packed, two pounds.

Price, without battery,	\$3.00
" with Novelty battery, size "A,"	4.50

## DYNAMO-ELECTRIC MOTOR.



No. 7. Above cut is about one-third actual size.

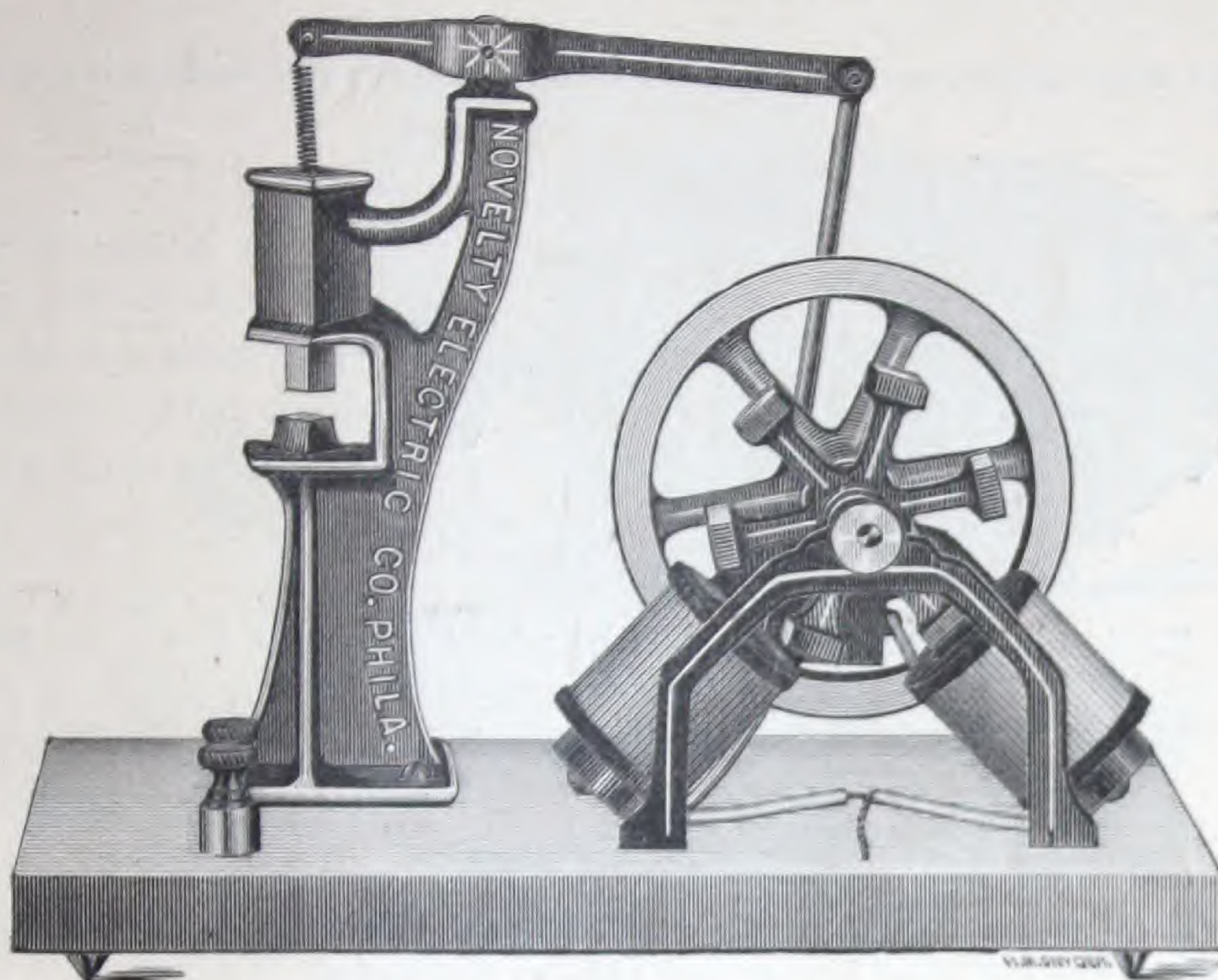
This cut represents a motor made with a wound armature, on the principle of the Siemens dynamo machine. It has a brass fly-wheel, three and one-half inches in diameter, operates with great rapidity, and is one of the most powerful toy motors that we manufacture. It will run very satisfactorily on one cell of Novelty battery, size "A." Size, packed,  $4\frac{1}{2} \times 8\frac{1}{2} \times 4\frac{1}{2}$  inches; weight, packed,  $2\frac{1}{2}$  pounds.

Price, without battery,	\$4.50
" with Novelty battery, size "A,"	6.00



## ELECTRIC MOTORS—Continued.

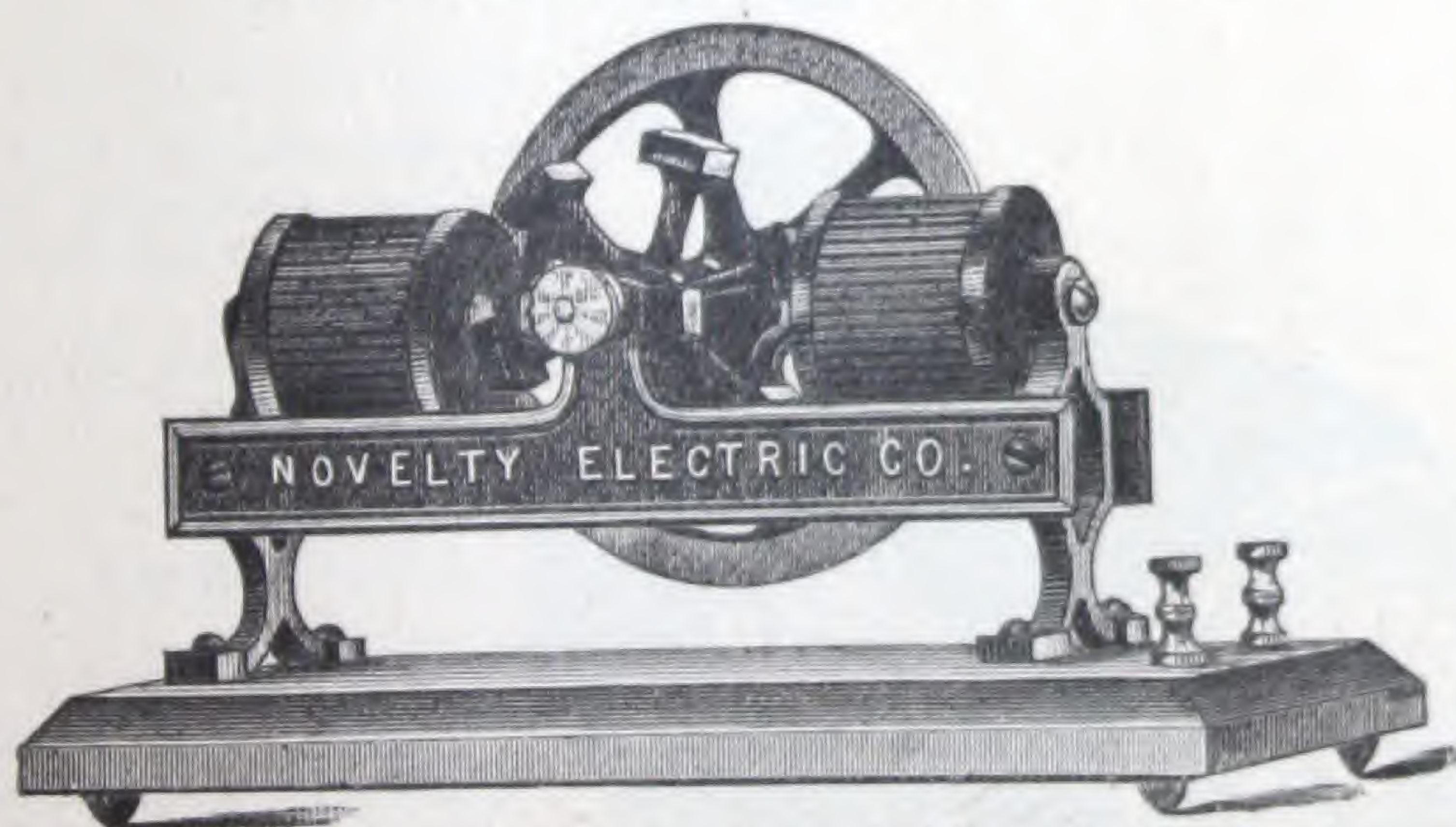
### TRIP-HAMMER MOTOR.



No. 8. Above cut is about one-third actual size.

Price, without Battery,	\$5.00
“ with Novelty Battery, size “A,”	6.50

### HORIZONTAL COMPOUND ENGINE.



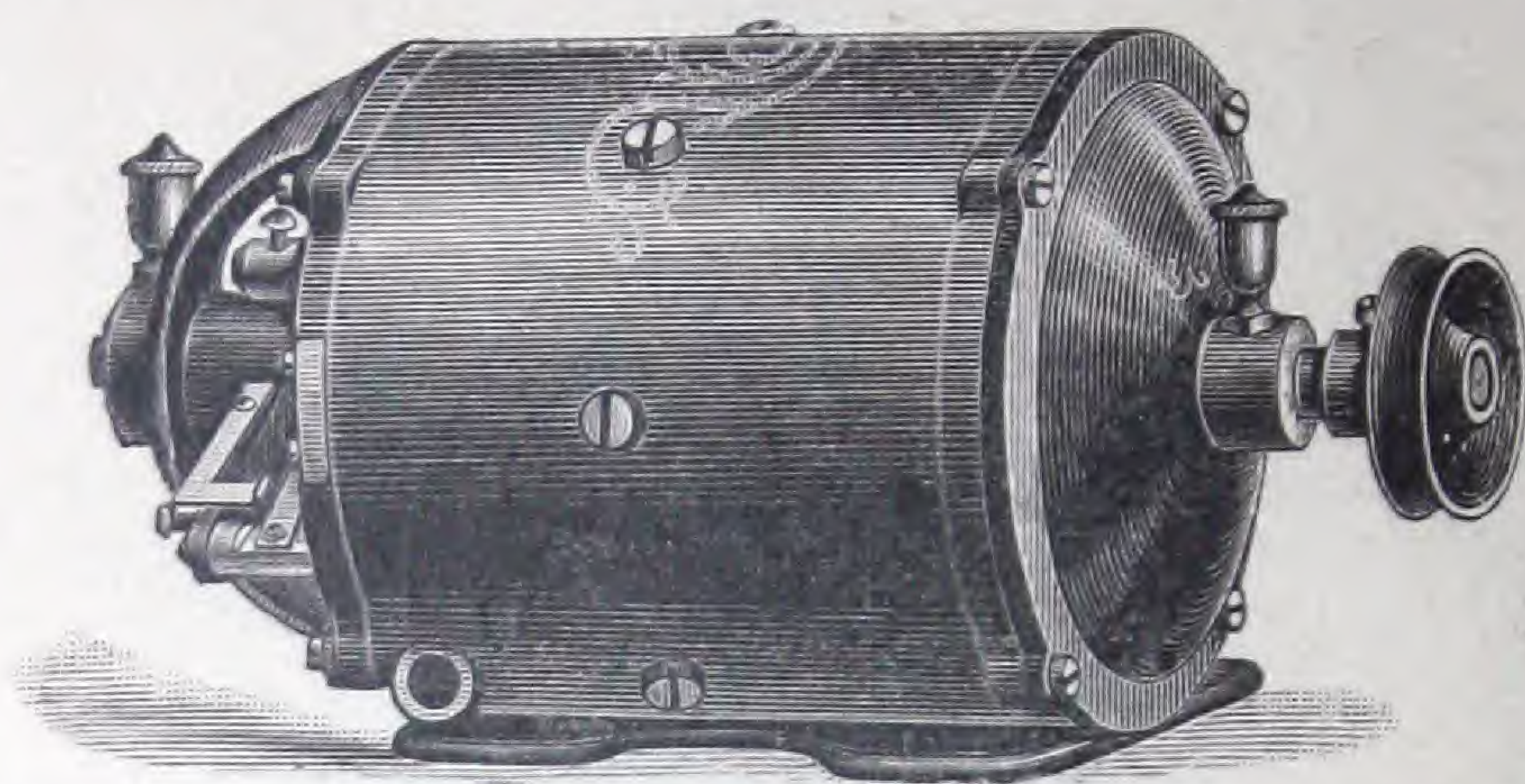
No. 9. Above cut is one-half actual size.

Price, without Battery,	\$4.00
“ with Novelty Battery, size “A,”	5.50



## EDGERTON ELECTRIC MOTOR.

For use where light power for practical use and a perfectly safe machine is required.



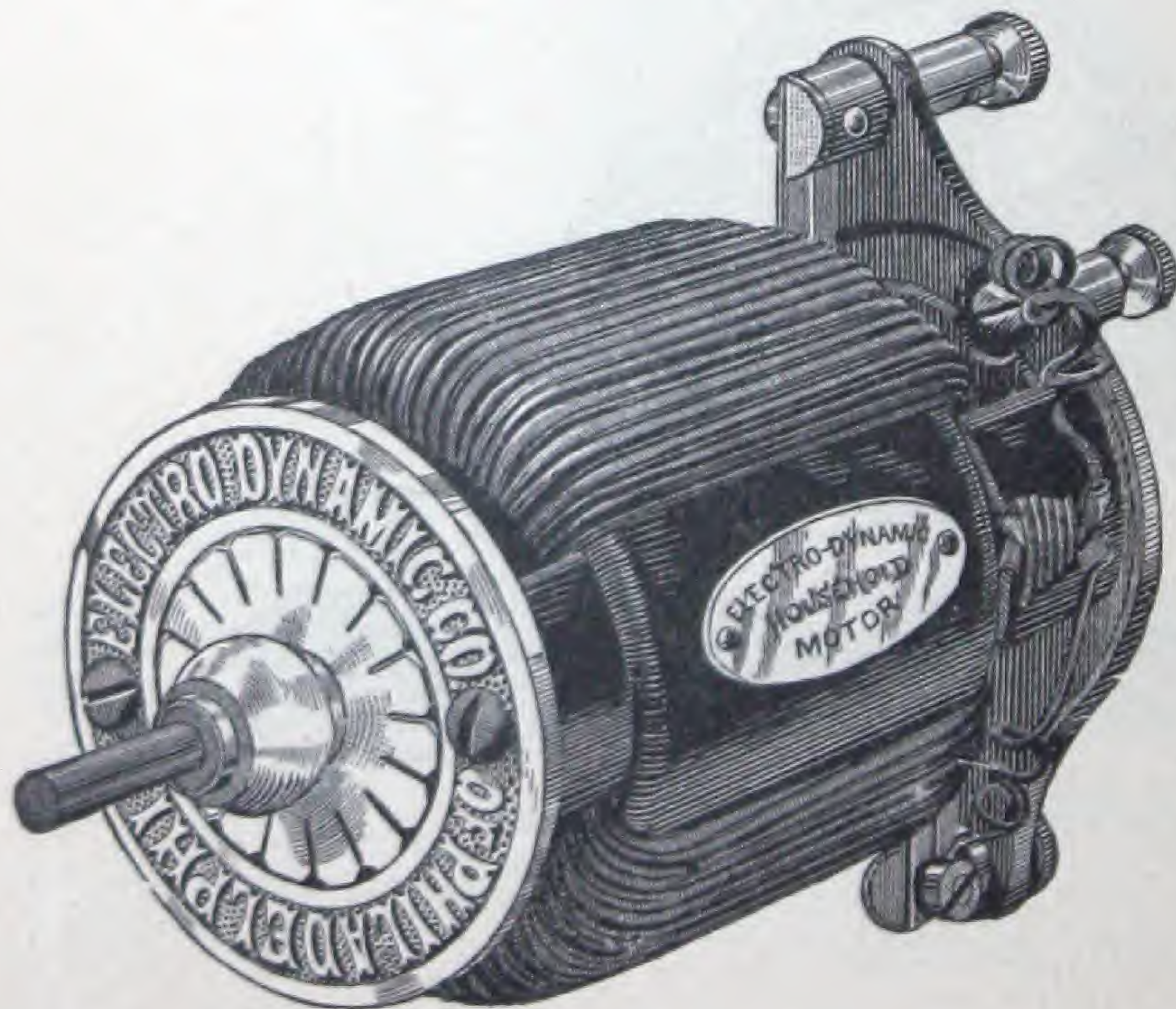
These Motors are operated by a current, either from a battery or dynamic circuit, and are unequalled in efficiency, simplicity and durability.

Price, No. 1, 4 inches diameter, for battery or arc-light circuit,	\$20.00
“ 2, 4 “ “ for incandescent-light “	25.00
“ 2, 6 “ “ for battery or arc-light “	30.00
“ 2, 6 “ “ for incandescent-light “	35.00

Batteries suited for these motors for driving sewing machines or ventilating fans, . . . . . 20.00

The above motors were awarded first medal at the Franklin Institute Electrical Exhibition, and gold medal at the New Orleans Exhibition.

## THE ELECTRO-DYNAMIC CO.'S DOUBLE INDUCTION MOTOR.



For running sewing machines, ventilating fans, and machinery where light power is required.

Awarded the Elliot Cresson gold medal by Franklin Institute.

### PRICES.

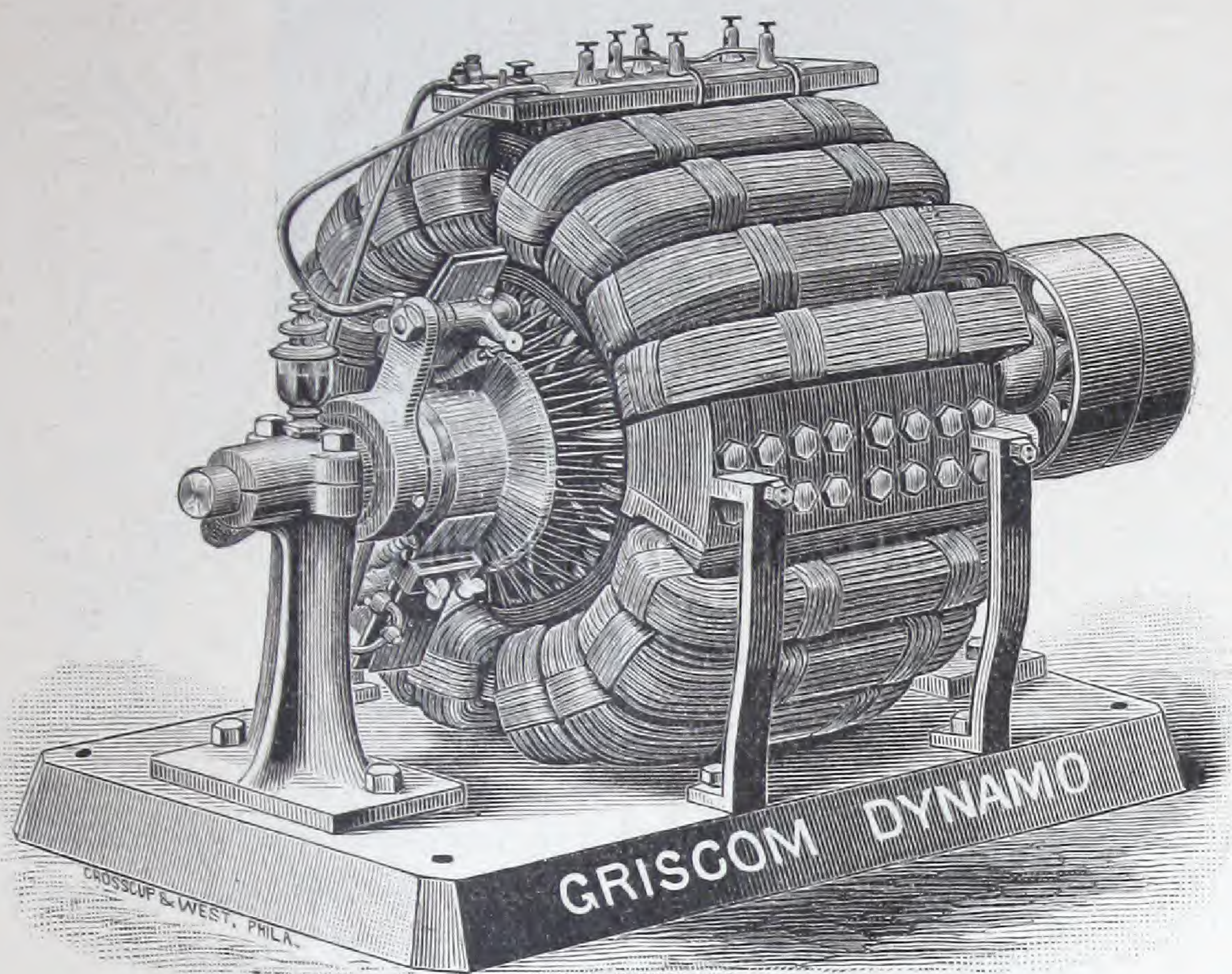
Nickel-plated, \$16.50

With hanger, belting and pulley, packed for transportation, by mail, postage prepaid, to any part U.S., \$18.00

With reversing attachment, . . . . . \$21.00



## THE GRISCOM DYNAMO.



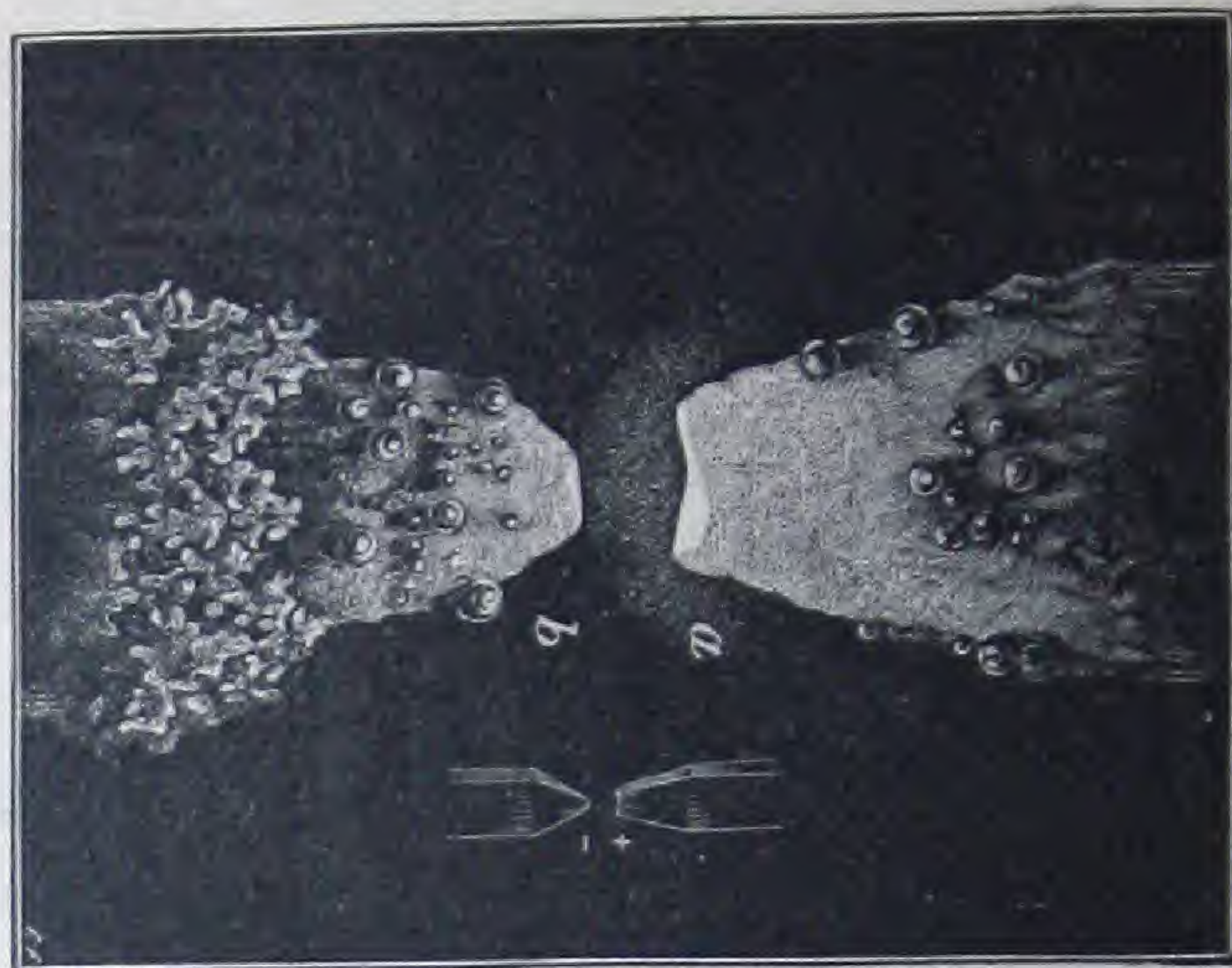
This is the most powerful, compact and efficient Dynamo for the production of light and power which has yet been devised. The workmanship is unequalled by that of any other Dynamo in the market. Like Double Induction Motor, it utilizes all the magnetic reaction of the field and armature.

### PRICES.

1	Horse-power for	Arc Light.....	\$200.00
1	"	" " Incandescent Light.....	250.00
5	"	" " Arc Light.....	500.00
5	"	" " Incandescent Light.....	600.00
10	"	" " Arc Light.....	750.00
10	"	" " Incandescent Light.....	850.00
15	"	" " Arc Light.....	1000.00
15	"	" " Incandescent Light.....	1200.00
20	"	" " Arc Light.....	1500.00
20	"	" " Incandescent Light.....	1700.00
25	"	" " Arc Light.....	2000.00
25	"	" " Incandescent Light.....	2200.00
Arc Lamps.....			50.00
Incandescent Lamps.....			1.50



## ELECTRIC LIGHT CARBONS.



### WALLACE, STAR, BOUETON.

#### PRICES, 12 inch Length.

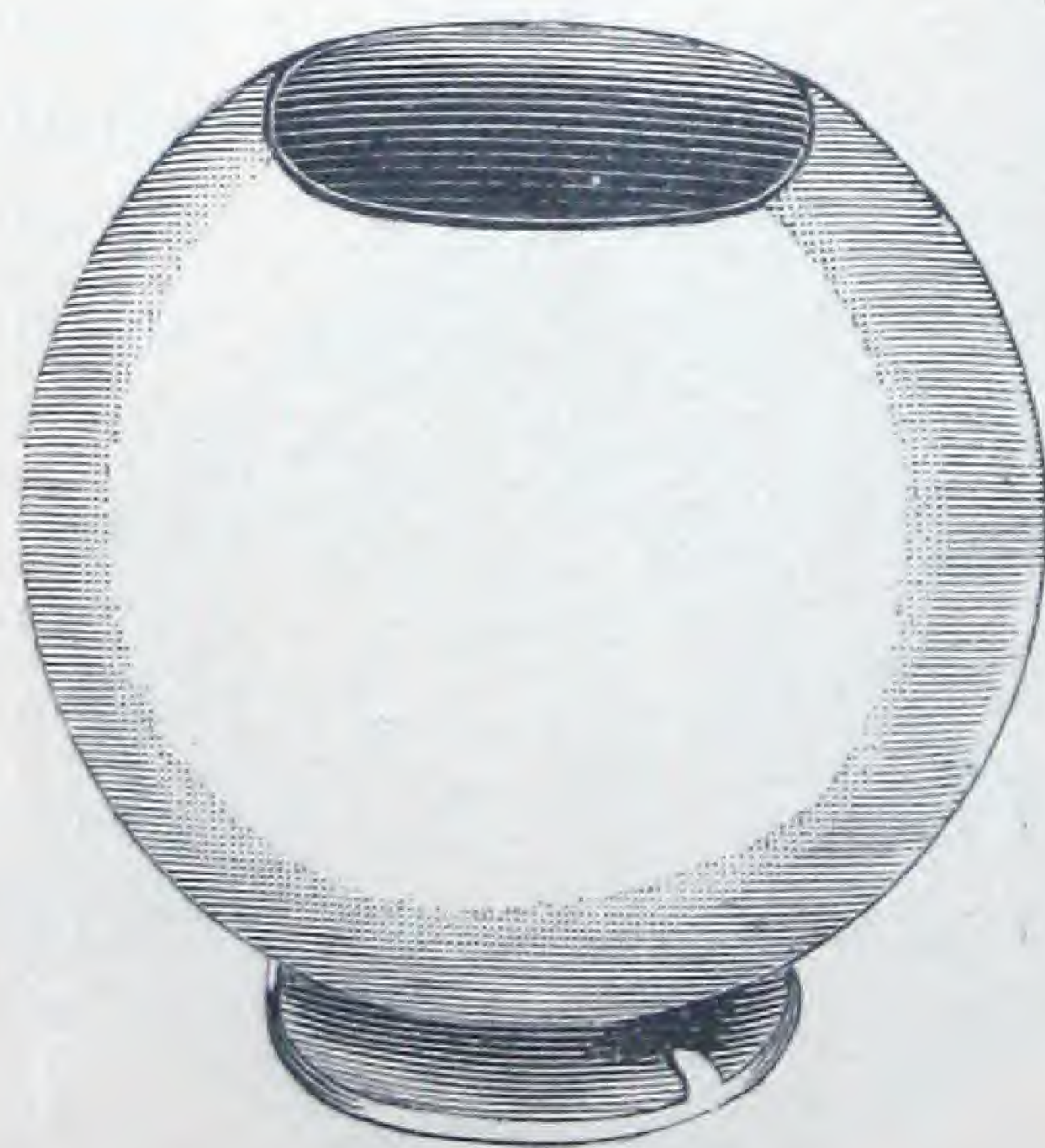
$\frac{1}{16}$ Diameter, each.....	\$ .05	$\frac{1}{2}$ Diameter, each.....	\$ .15
$\frac{1}{8}$ " " .....	.05	$\frac{9}{16}$ " " .....	.17
$\frac{3}{16}$ " " .....	.06	$\frac{5}{8}$ " " .....	.20
$\frac{1}{4}$ " " .....	.06 $\frac{1}{2}$	$\frac{3}{4}$ " " .....	.25
$\frac{5}{16}$ " " .....	.08	$\frac{7}{8}$ " " .....	.28
$\frac{3}{8}$ " " .....	.11	1 " " .....	.34
$\frac{7}{16}$ " " .....	.13	1 $\frac{3}{4}$ " " .....	.40

In cases of 300 and 500, special price will be given.

### CARBON BUTTONS.

$\frac{3}{8} \times \frac{3}{16}$ per 100, . . . . .	\$4.00
$\frac{11}{16} \times \frac{1}{32}$ " 100, . . . . .	8.00

### GLOBES, FOR ELECTRIC LIGHTS.



We furnish all descriptions of globes in use, for electric lighting, either of Opal, Crystal, Flint or Obscured, of any shape or size desired.

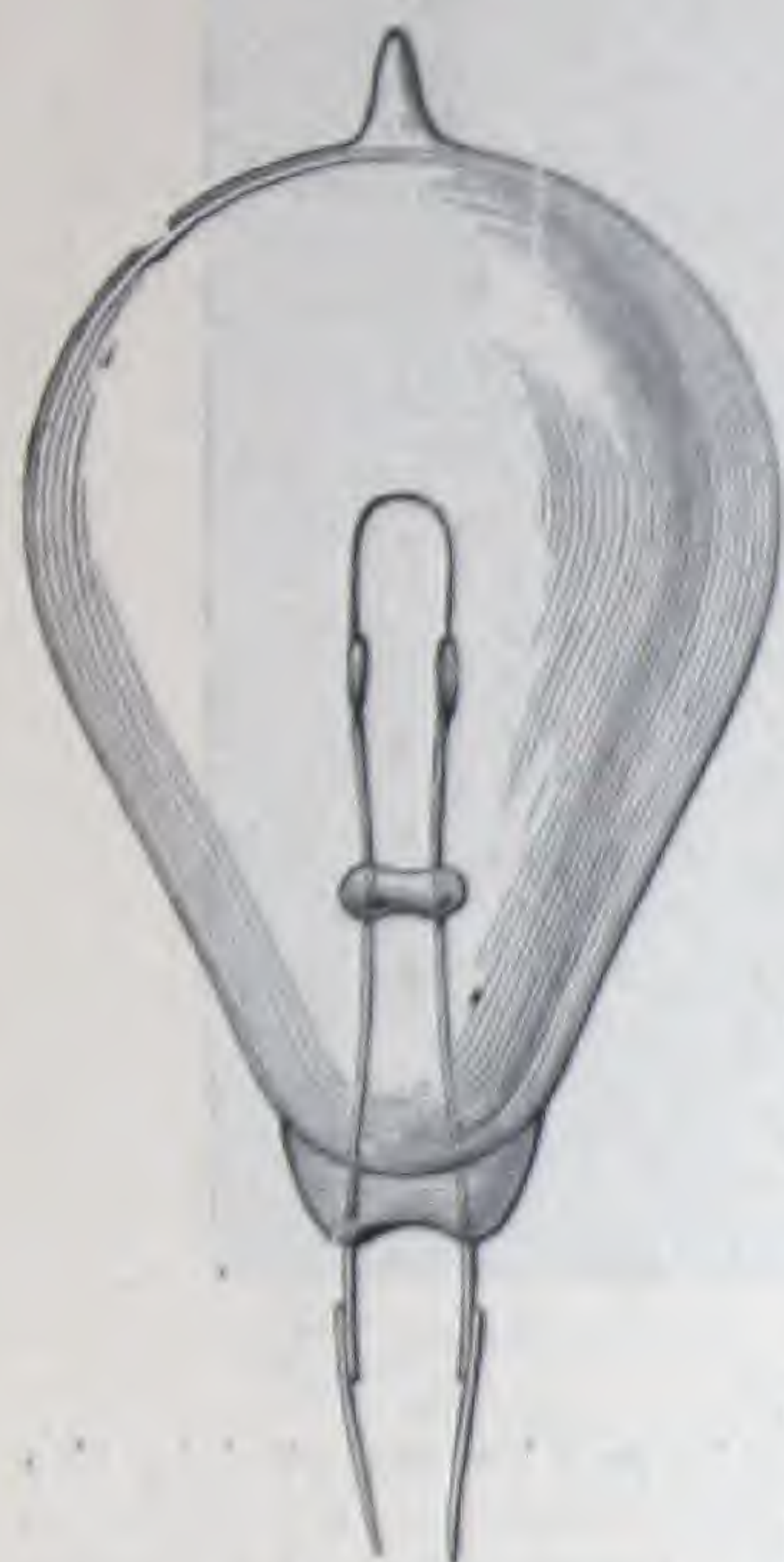
#### PRICES.

	Clear.	Rough.
8x10, Cylinder shape, per doz.,	\$7.50	\$8.50
10x12 " " " "	9.00	10.00
10 inch Globe " " " "	6.50	7.50
12 " " " " " "	8.50	10.00
9x12, Maxim's " " " "	6.50	7.50
10x12, Pear " " " "	7.00	8.00



## EDISON MINIATURE LAMPS.

From  $\frac{1}{2}$  to 6 Candle Power.



Cut full size of 6-candle lamp. Resistance, 6 to 7 ohms. Requires from 9 to 15 volts electro-motive force, and 1.40 amperes of current.

4-CANDLE LAMPS. Resistance, from 5 to 6.5 ohms. Requires from 7 to  $8\frac{1}{2}$  volts electro-motive force, and 1.40 amperes of current.

3-CANDLE LAMPS. Resistance 3.6 to 4.5 ohms. Requires from  $5\frac{1}{2}$  to 7 volts electro-motive force, and 1.50 amperes of current.

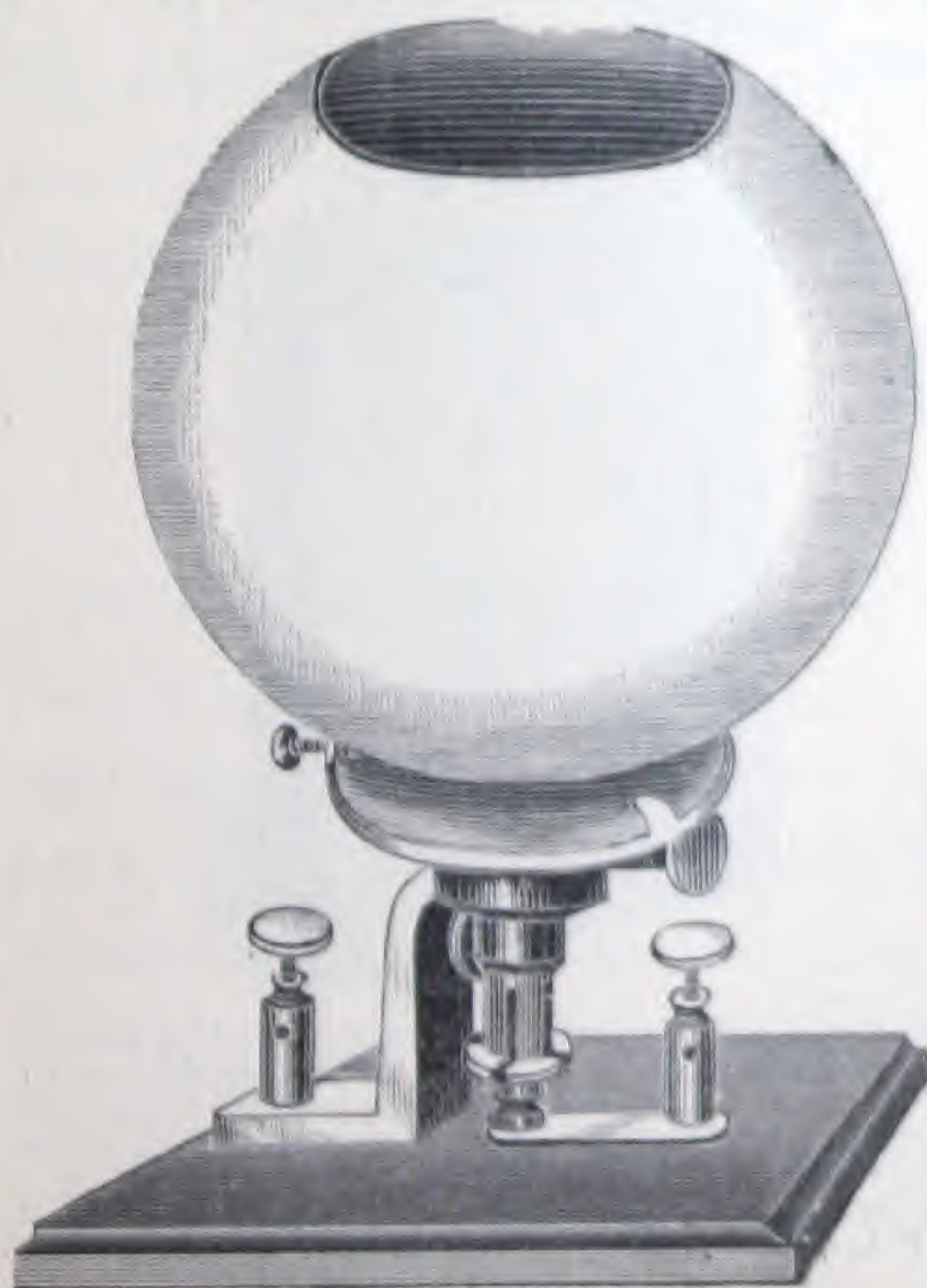
2-CANDLE LAMPS. Resistance, 3.3 to 5 ohms. Requires from  $4\frac{1}{2}$  to  $5\frac{1}{2}$  volts electro-motive force, and 1.20 amperes of current.

1-CANDLE LAMPS. Resistance, 2.9 to 4.5 ohms. Requires from 3 to 5 volts electro-motive force, and 1.12 amperes of current.

$\frac{1}{2}$ -CANDLE LAMP. Resistance, 1.3 to 3.2 ohms. Requires an electro-motive force of from 2 to 4 volts, and 1.3 amperes of current.

Price, each above sizes,

\$1.50



### NEW PORTABLE ARC-LAMP.

The accompanying illustration represents the new portable arc-lamp; a novel apparatus requiring less space than any of its class that we have seen. The size of the original of our illustration is about  $6\frac{1}{2}$  inches high by  $4\frac{1}{4}$  inches square at the base. Including carbons and globes, it weighs only one pound, and yet is capable of giving a very brilliant light.

Price,

\$5.00



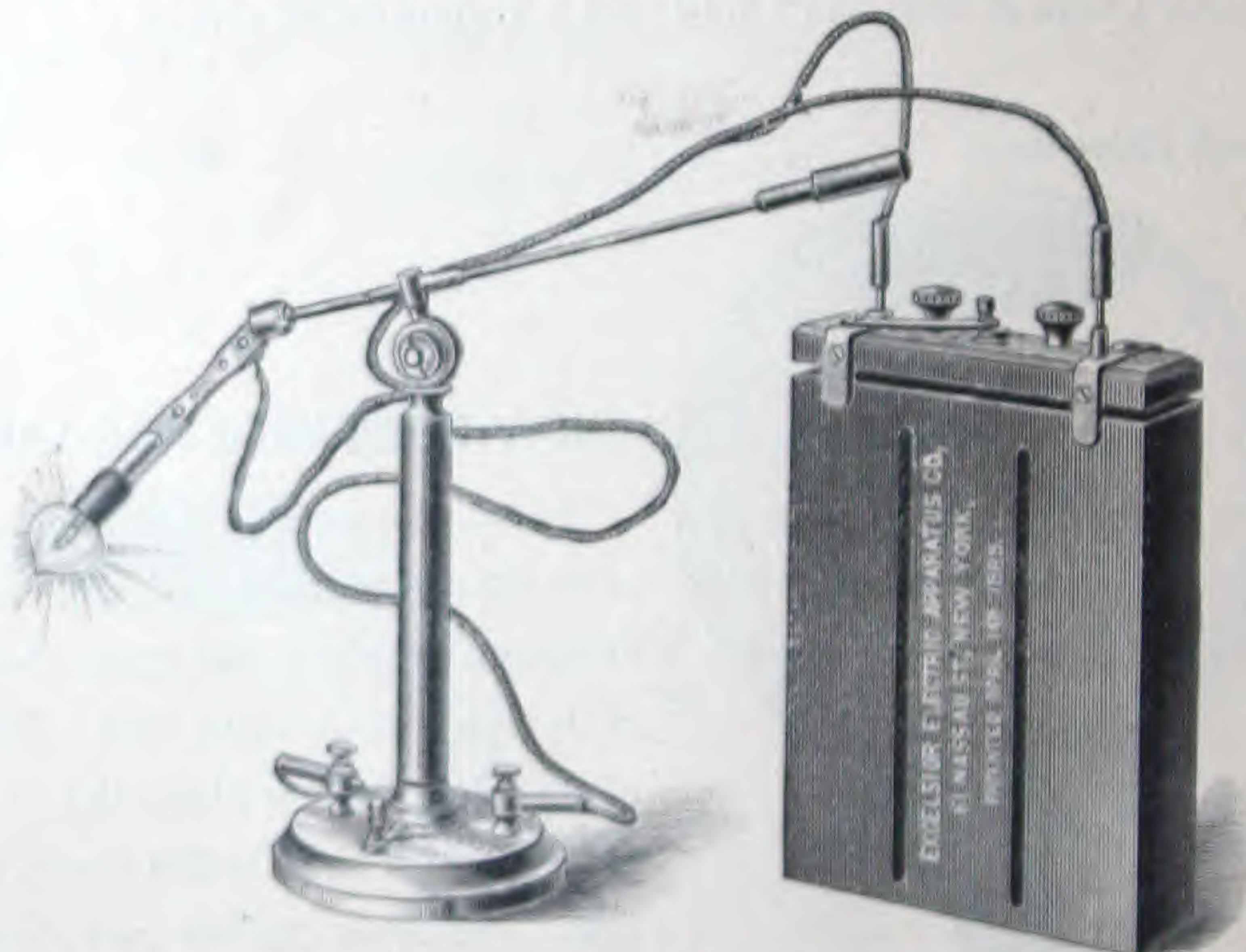
## EDISON ELECTRIC SCARF PIN AND "HAID" ELECTRIC BATTERY.



### THE GREATEST NOVELTY OF THE AGE.

A small Edison Incandescent Electric Lamp is mounted on a scarf pin, or it can be secreted in the centre of an artificial bouquet or rose, and by simply pressing on a small button attached to a silk-covered wire, placed under the clothing and connected with the battery, which latter is carried in the pocket, the lamp lights up most brilliantly, creating much surprise and admiration from all who see it, especially as no one who is not in the secret can understand how the light is produced, the wire being placed under the clothing, and the push-button and battery in the pocket, and consequently nothing except the lamp is exposed to view. Price complete, \$6.66 each.

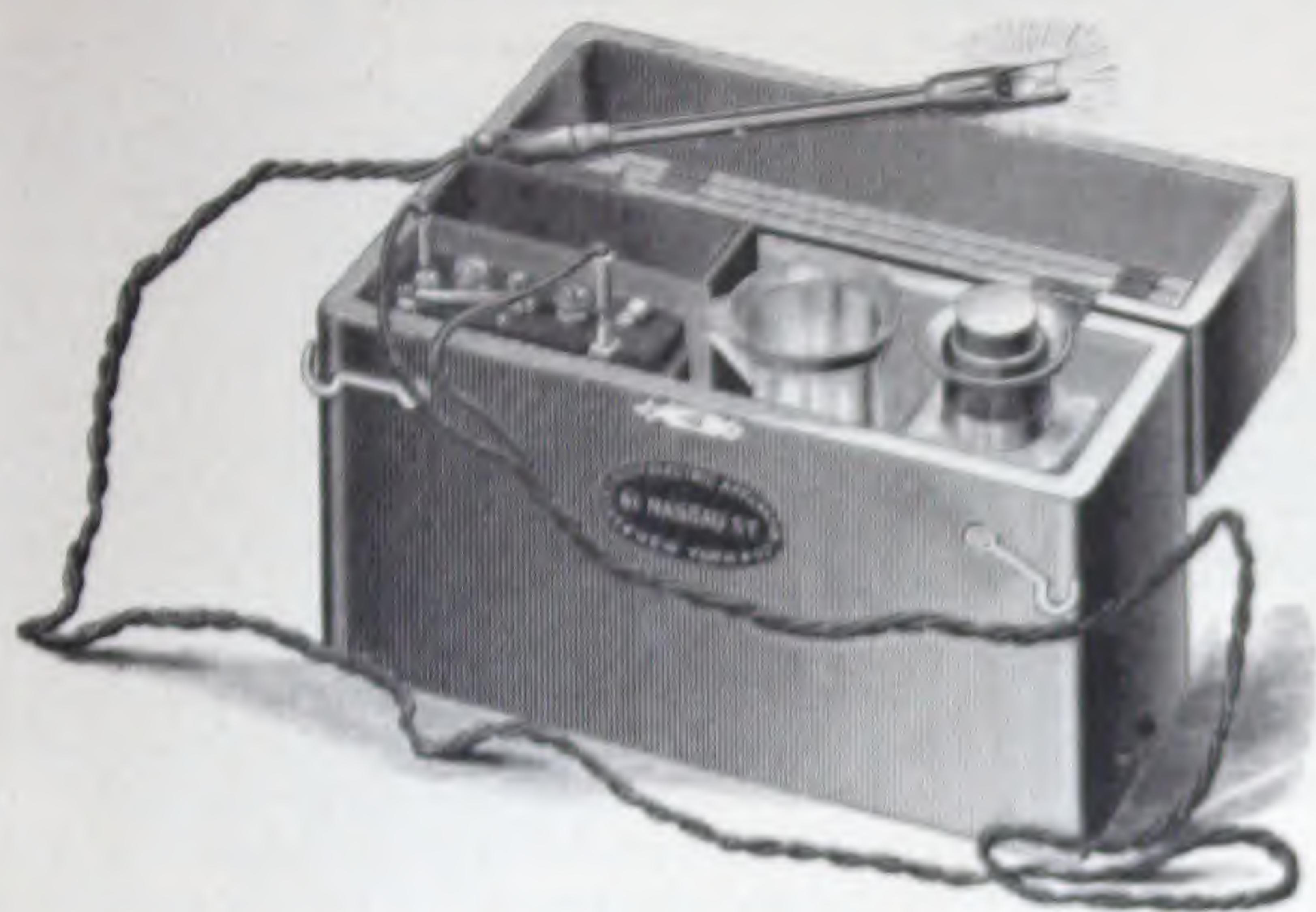
### MICROSCOPIC STAND AND BATTERY.



The incandescent lamp is movable in any desired direction, and may be brought in the closest proximity to the object, thus avoiding the uses of lenses and condensers. Where opaque objects are to be analyzed the lamp may be put right beneath the object, and the use of a concave mirror dispensed with. The apparatus enables the microscopist to operate entirely independent of any other source of light—natural or artificial—and to obtain all the different effects of either concentrated or diffused light. The absence of any perceptible heat-rays permits to so cover the lamp as to exclude any radiation of light as may be objectionable to the observer's eye. Price, \$18.00



## “Haid” Pocket Battery and Illuminating Appliance.



This Battery is adapted to the wants of all physicians, one of its special uses being for the purpose of illuminating the cavities of the human body.

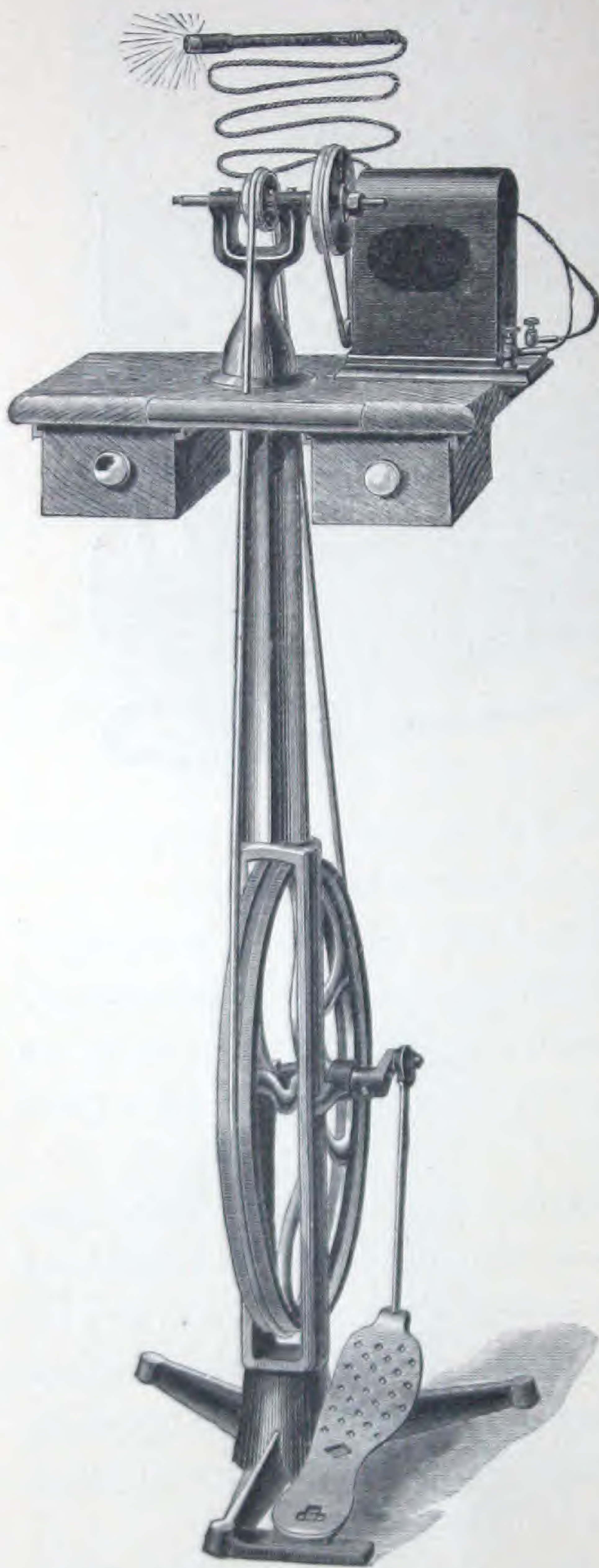
The lamps are mounted on a hard rubber handle; by the aid of this appliance, the physician is enabled to thoroughly examine the throat and all accessible cavities of the human body; it can also be used in connection with the speculum; the handle is so constructed that the radiating heat from the lamp in no wise affects any part of the body.

A switch attached to the battery will turn on or extinguish the light at pleasure. It will burn an incandescent light two hours continually, the current being perfectly constant and uniform. If used in the ordinary manner, *i. e.*, for a few minutes only at a time, it will last for many days. No small-sized battery, to compare with this, has ever been placed before the profession. Holding about one-half pint of exciting liquid, it actually replaces a battery containing several gallons. No material is consumed while the Battery is not being used.

The price of battery including Lamp-Holder and Lamp as described above, 6 feet of cord, extra zincs, a bottle of solution and measure, put up in a polished cherry wood case, with nickel-plated handle and mountings, . . . . . \$18.00



## The Portable "Haid" Hand-Dynamo Machine.



The "Haid" Hand-Dynamo Machine weighs about  $8\frac{1}{8}$  lbs. Comes put up in a polished walnut case with nickel-plated handle and mountings. This machine is intended to run small incandescent lamps for surgical, dental, microscopical and scientific purposes. By turning a small crank or handle attached to the side of the case, the machine is set in operation; the lamps used with it come in various sizes, the smallest of them giving a light equal to three candles, the largest ten candles.

They are mounted on a hard rubber handle. By the aid of this appliance, the physician is enabled to examine the throat thoroughly. It can also be used in connection with the speculum; in fact, any accessible cavity of the human body can be illuminated for inspection. The handle is so constructed that the radiating heat from the lamp in nowise affects any part of the body.

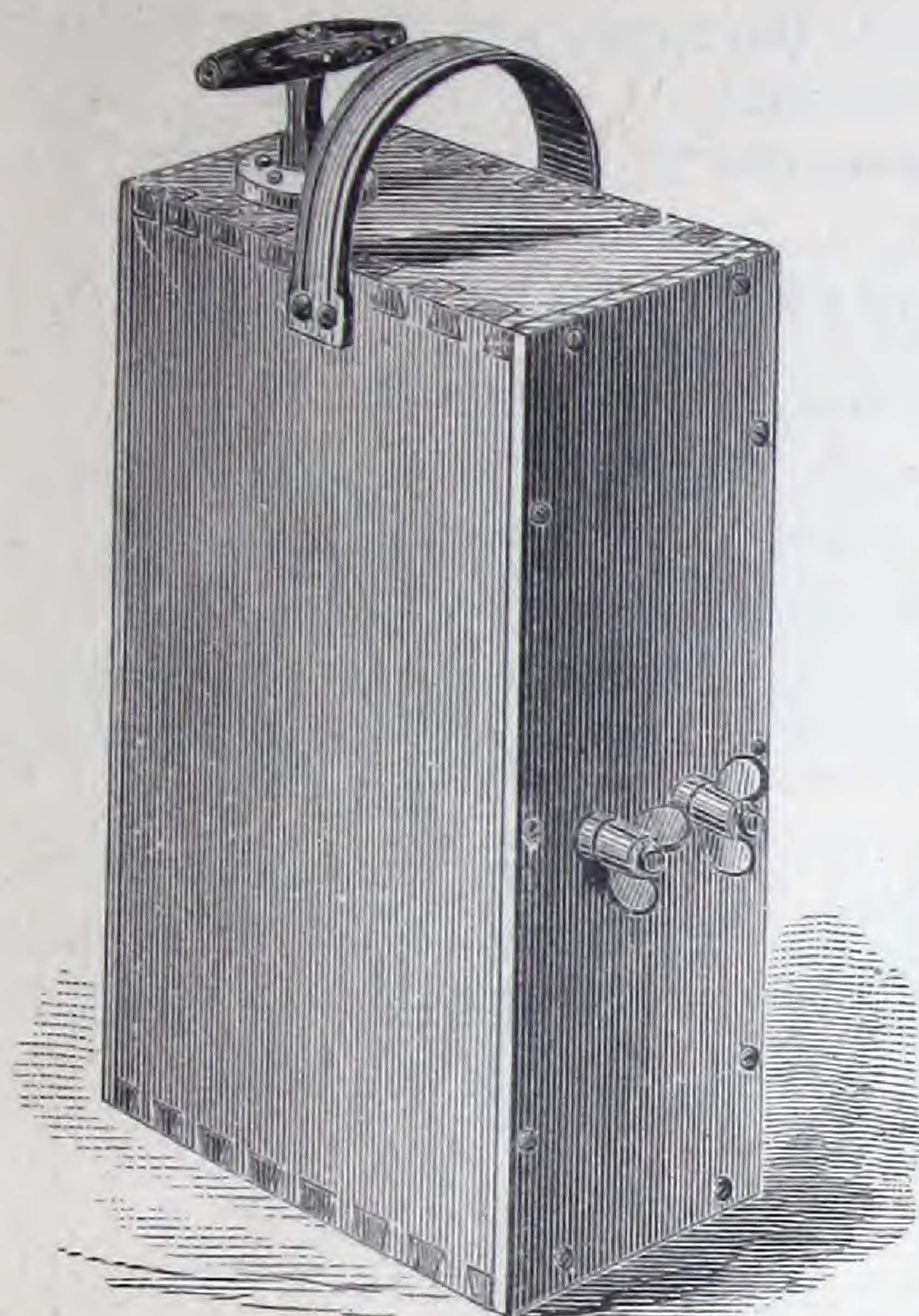
This Dynamo Machine has been tested by some of the most prominent physicians and dentists, and they universally agree that it is a marvel—a long-felt want—especially as it is *always ready for use, and in no way liable to get out of order.*

These machines can also be worked with the aid of an assistant, the machine being placed in an adjoining room, and the insulated wire carrying the current run to a distance from 100 to 350 feet, and even more, without losing any perceptible amount of light; or the machines can also be run by various kinds of small motors, such as descending weights, water-power, etc.

The price of this machine complete, including lamp-holder, lamp, and 6 feet of cord, . . . . . \$35.00



## MAGNETO BLASTING MACHINE.



The blasting machine which has the greatest sale at the present time is a magneto-electric instrument of small size, weighing only about 16 pounds, occupying considerably less than one-half a cubic foot of space, and sold at \$25. It is constructed on the Wheatstone and Siemens principle, having a magnet of the horseshoe character, of iron, wound about with coils of insulated copper wire. Between the poles of the magnet there is fitted to revolve an armature of cylindrical construction, carrying in its body other insulated wire coiled longitudinally as to the cylinder. The rapid revolution of the armature, by suitable means, generates and sustains in the machine an accumulative current of voltaic electricity of great power, which, at the moment of its maximum intensity, is practically switched off to

the outside circuit, in which are the fuses, and in the interior of each fuse the ignition is accomplished instantly.

All the machines are protected by patents, covering some important and indispensable parts.

Illustrated circulars sent on application.

Price, Magneto Blasting Machine, . . . . . \$25.00

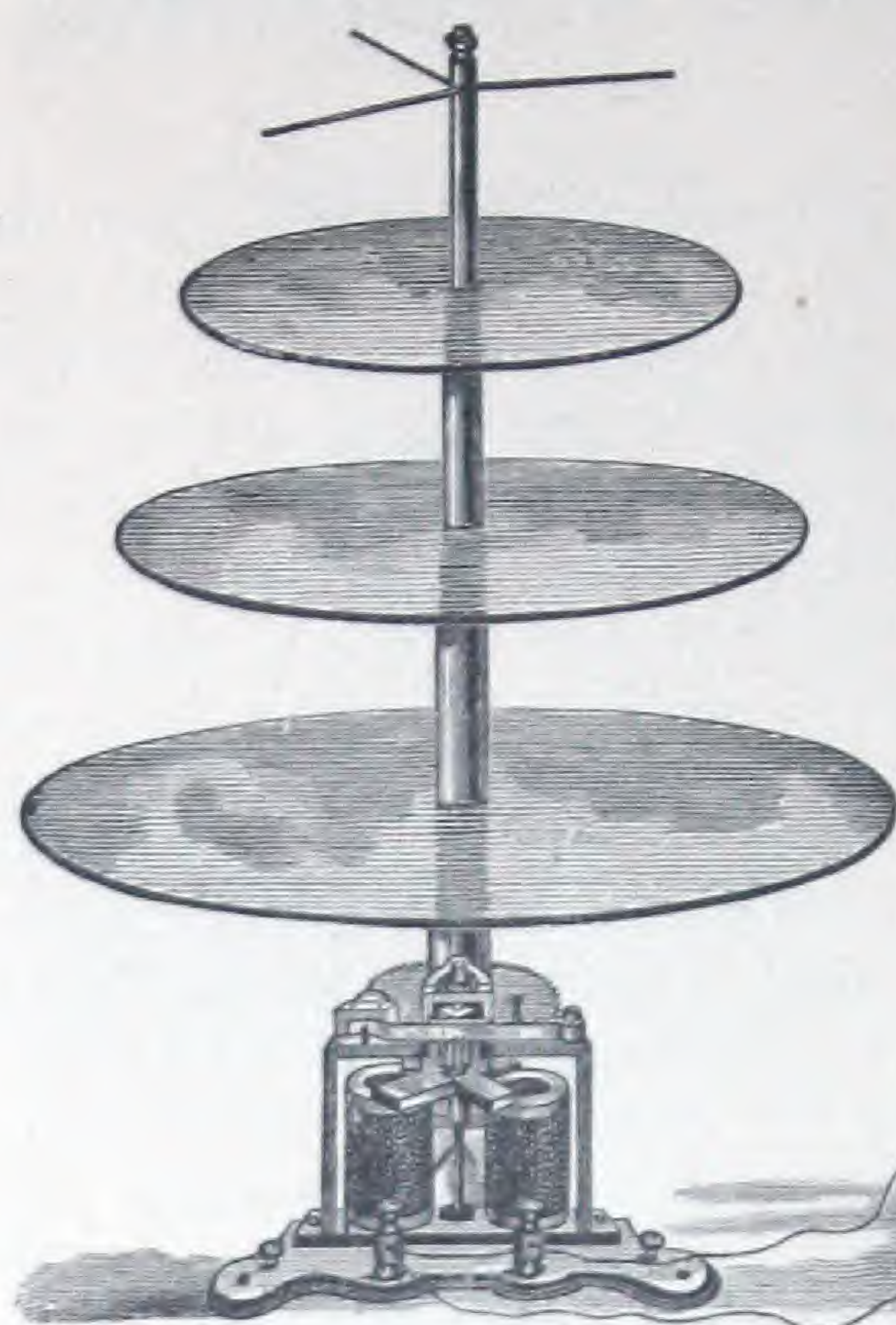
### Platinum Fuses, Cotton Covered, for use with Magneto-Electric Machine.

4 ft. wires, each.....	3½ Cts.
6 " " ".....	4½ "
8 " " ".....	5¼ "
10 " " ".....	6 "
12 " " ".....	6¾ "
14 " " ".....	7½ "
15 " " ".....	8¾ "
16 " " ".....	9¼ "

Fuses with longer wires at the rate of one-third of one cent per foot additional.



## ELECTRICAL TURNTABLE.



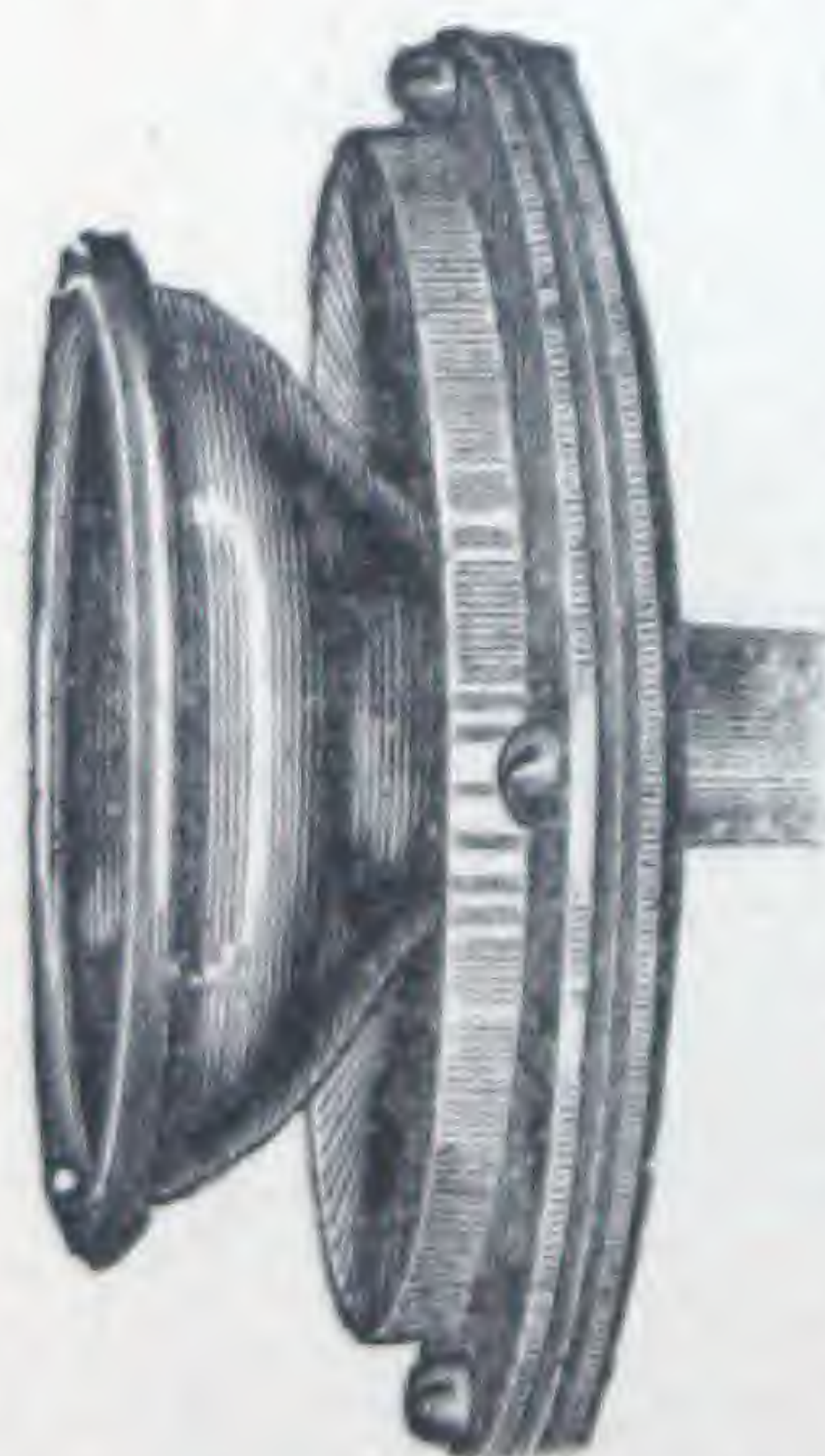
For Show Windows, Glass Cases, and for Exhibitions of every kind.  
The Best, Cheapest, and Most Reliable in the Market.  
Medal Awarded at American Institute Fair.

### A FEW POINTS TO BE REMEMBERED.

1. Cost of running six months, \$1.50.
2. It needs no winding up of clockwork.
3. No expensive springs to renew.
4. Or damage through falling of weight.
5. No necessity of balancing articles on table.
6. It will carry 50 lbs.; can carry 100 lbs. by use of more battery.
7. Runs steady and uniform.
8. No necessity of support from the top; can be made any height.

### PRICES.

Turntable, complete, with Battery (2 cells), without glass shelves,	\$25.00
Extra Battery, to increase power and speed of motor, each cell,	2.00
Glass Shelves, 12-in. diameter, with centre hole, each,	2.00
"    "    15-in.    "    "    "    "    "    "    "	3.00
"    "    20-in.    "    "    "    "    "    "    "	4.00
Velvet Shelves, 12, 15 and 20-in. in diameter, (set of three),	4.00
Extra Zincs, each,	.50
Square Lead Jar,	1.45
Blue Stone (5 lbs. each cell), per lb.,	.10



## ELGIN TELEPHONE.

Patented February 22d, 1881.

This Telephone is made entirely of metal, handsomely proportioned, nickel-plated, and self-supporting. Requires no brackets, not even a screw to hold it in place. Acknowledged by all who have used them to be the neatest and best working Acoustic or Mechanical Telephone upon the market. It will work upon a line one-half mile long. It, however, depends more upon the relative position of the stations to be connected than the distance. The longer the line, the more difficult it is to keep taut.

Price per Set (2 Telephones) with Wire Hangers, etc., complete, \$5.50



APPLGATE'S PATENT ELECTRIC

STORE ALARM

HOUSE BURGLAR AND FIRE ALARM

BATTERY

ELECTRIC

PAPER PADDING

MOST RELIABLE

APPLIED

QUICKLY

PERFECT SECURITY NOW

2 FT.

3 FT.

4 FT.

5 FT.

6 FT.

PAT. BEVEL

MATTING

They are easily and quickly fitted, without disfigurement. There is no cutting into doors or windows, and can

"	Padding or Edge Trimming,	10 in.	wide, per foot	\$ .50
"	" "	4 " "	" "	.03
"	Corners,	10 " "	" "	.02
"	" "	4 " "	" "	.03
"	" "	4 " "	" "	.02

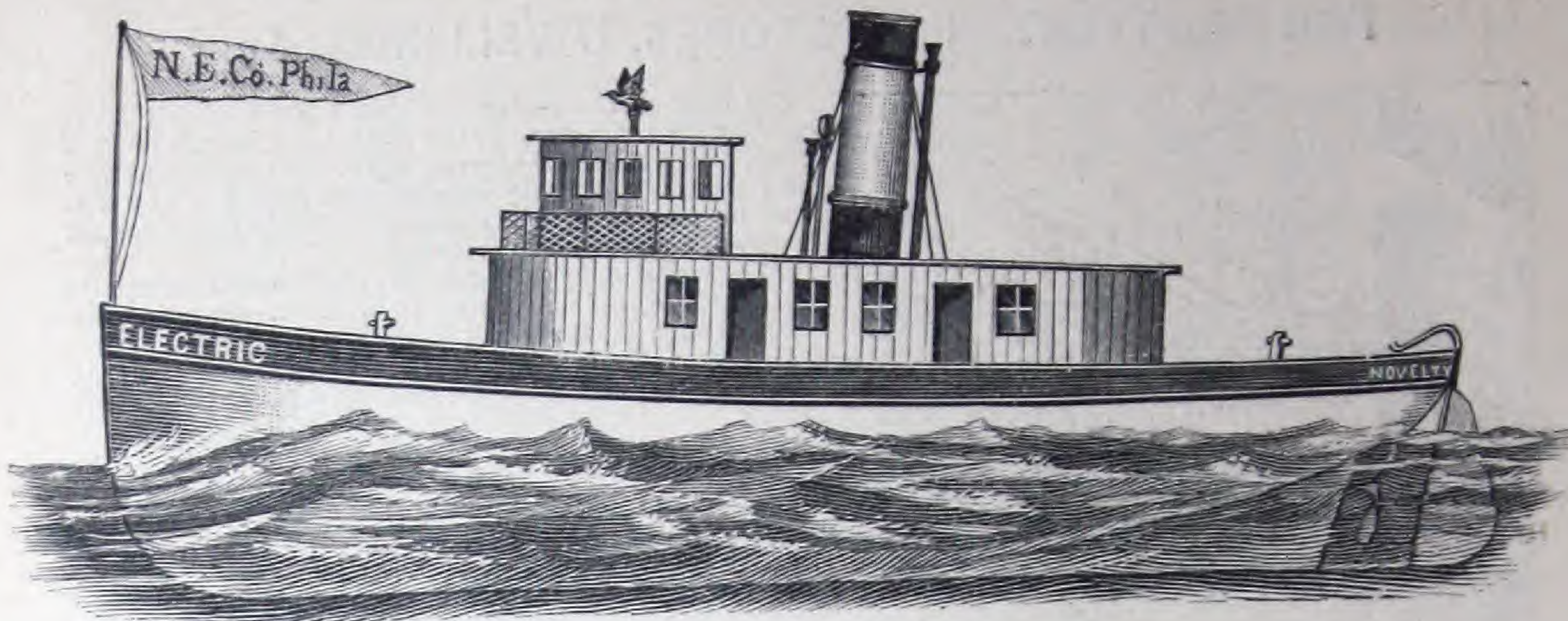
## An illustration of a mechanical display for the 'NOVELTY ELECTRIC CO.' The display is housed in a large, arched enclosure. At the top, the text 'NOVELTY ELECTRIC CO.' is prominently displayed. A horizontal shaft runs across the top, supported by brackets, with several pulleys. A large electric motor with a prominent flywheel is positioned on the right side. A belt connects the motor's flywheel to a smaller pulley on a lathe. Another belt connects the motor to a saw. The display includes various mechanical tools and equipment, including a lathe, a saw, and a small table. The entire setup is designed to showcase the company's electrical and mechanical capabilities.

Cut about one-fifth actual size.

Price, complete (without battery)	\$14.00
“ “ (with battery)	15.50



## ELECTRIC TOYS—Continued.



Above cut is two-ninths actual size.

## NOVELTY TUG "ELECTRIC."

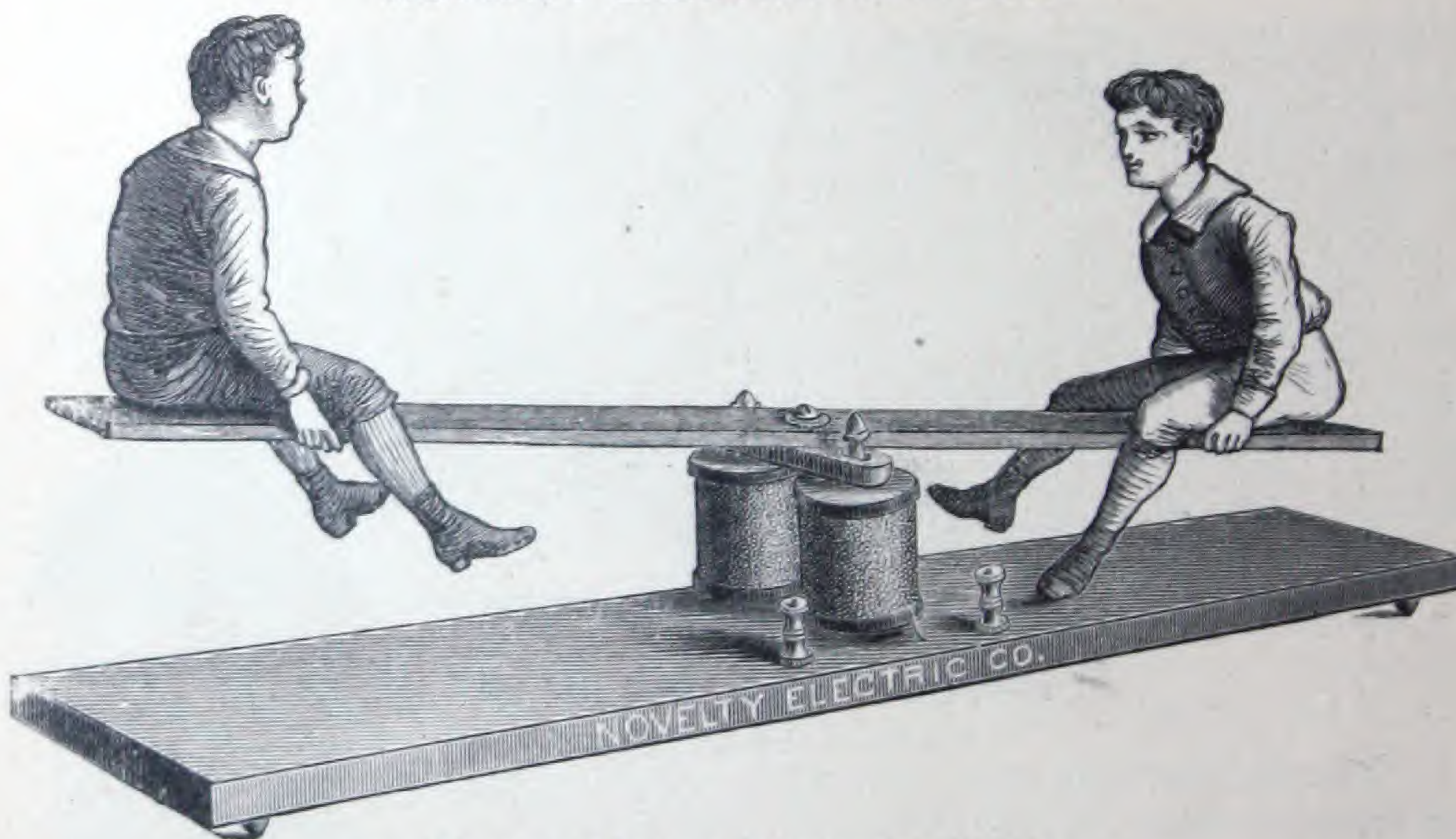
The improved "Electric" is a very handsome and attractive tug-boat, driven by electricity. It has a metal hull and is fitted with a screw propeller. The power is supplied by a Novelty battery of original design, that is concealed by the pilot-house and cabin. By depressing the brass rod that carries the ornament shown above the pilot-house, the battery is placed in service, and the boat starts instantly, and rapidly acquires increased speed. When not in service the rod should be raised.

The boat is carefully modeled and ballasted, with reference to its being made thoroughly seaworthy.

Price,

\$16.00

## NOVELTY ELECTRIC SEE-SAW.



Above cut is one-third actual size.

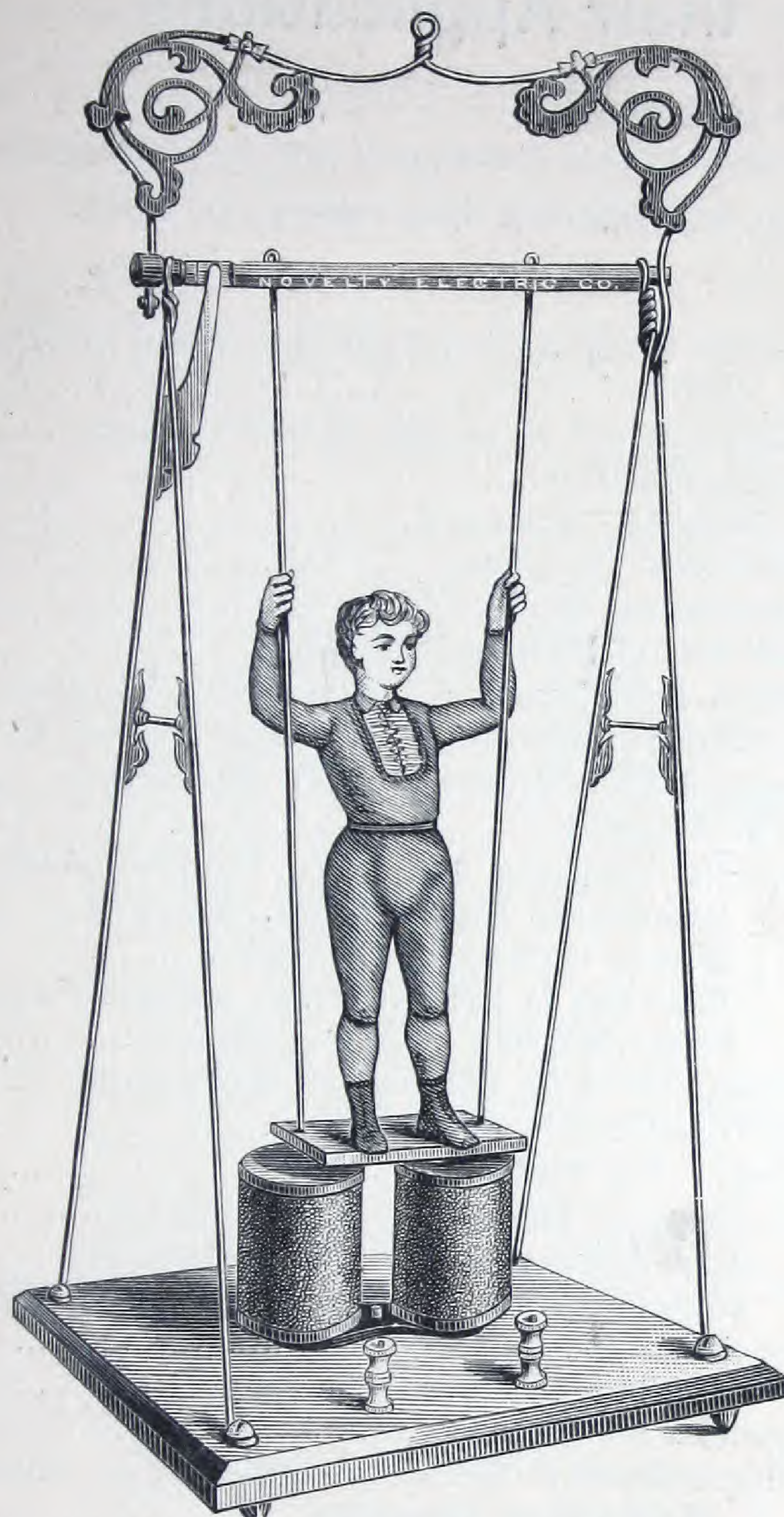
This amusing toy is complete and ready for action, requiring only connection with a battery to put it in motion. It will operate very well with one cell of either the Leclanche or the Novelty battery, or with any other of equal power. When boxed ready for shipment it measures  $3\frac{1}{2} \times 9\frac{1}{2} \times 6\frac{1}{2}$  inches, and weighs two pounds.

Price, without battery,  
" with Novelty "A" battery,

\$3.00  
4.50



# ELECTRIC TOYS—Continued.



Above Cut one-third actual size.

## NOVELTY ELECTRIC SWING.

This cut speaks for itself, and represents an interesting and life-like toy. It swings easily with one cell of the Novelty "A" battery. Size, when packed, 6x6x12 inches; weight, when packed, two pounds.

Price, without battery,	\$4.00
“ with Novelty “A” battery,	5.50



## Books on Electricity, Magnetism, and their Applications.

Any work described in this Catalogue will be sent, postage prepaid, to any address upon receipt of Price.

ABERNETHEY—Commercial and Railway Telegraphy Theory and Practice, illustrated, cloth.....	\$2.00
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## The Harden Star Hand Grenade.

THE MOST EFFECTIVE FIRE EXTINGUISHER EVER INVENTED.



Always ready for use.

Never gets out of order.

Never freezes.

The Harden Hand Grenade Fire Extinguisher consists of a glass globe, hermetically sealed, filled with a chemical fluid which does not deteriorate with age. It is not affected by any climate; will resist a temperature of twenty degrees below zero, and is perfectly harmless to flesh or fabric.

The contents of these grenades, when thrown upon or into the fire, vaporize immediately into immense volumes of fire extinguishing gas, in which combustion cannot possibly exist.

We equip factories and dwellings with this grenade, arranged in electric circuits to ring a fire alarm on a bell placed in the office, or any other desired location.

### HOW TO USE IT.

The general rule to be always observed is this: Take the quickest and surest method possible to break the grenades and scatter the contents into the fire.

If the fire covers a hard, flat surface, like the walls or floor of a room, throw the grenades hard enough to break them and scatter their contents into the fire. Should the fire occur among soft substances, like drapery, a pile of rags, hay or shavings, where they cannot be approached to break the grenades into the flame, break them into a dish, and dash the contents upon the fire.

*It is the gas generated that extinguishes the fire.*

Price, No. 1, Pints, per Dozen,	\$10.00
" No. 1, Wire Baskets, holding $\frac{1}{2}$ dozen pint bottles, each,	.50
" No. 4, " " " " " " " "	.30

Estimates furnished for Electric Fire Alarm Connection on application.



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